The Department of Defense

Small Business Technology Transfer (STTR)

FY 1996

PROGRAM SOLICITATION
Closing Date: 5 APRIL 1996

Department of the Army

Department of the Navy

Department of the Air Force

BMDO Ballistic Missile Defense Organization

ARPA Advanced Research Projects Agency

PROGRAM SOLICITATION

Number 96

Small Business Technology Transfer (STTR) Program

IMPORTANT

The DoD updates its SBIR/STTR Mailing list annually. To remain on the mailing list or to be added to the list, send in the Mailing List form (Reference E), found at the back of this solicitation, to DTIC. Failure to send in the form annually will result in removal of your name from the mailing list.

For general questions about the Defense Department's STTR program, please call the SBIR/STTR hotline at (800) 382-4634

U.S. Department of Defense
STTR Program Office
Washington, DC 20301

Opening Date: DECEMBER 1, 1995
Closing Date: APRIL 5, 1996

Deadline for receipt of proposals at the DoD Component is 2:00 p.m. local time.

OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON DC 20301-3000

ACQUISITION AND
TECHNOLOGY

IMPORTANT NEW FEATURES OF THE DEFENSE DEPARTMENT'S STTR PROGRAM

This solicitation reflects a number of important changes in the Defense Department's STTR program. These changes, which also apply to the Small Business Innovation Research (SBIR) program, were developed by representatives from across the Department, and are designed to significantly increase the Department's success in converting STTR and SBIR research into affordable, high-performance products which serve the needs of our armed forces. The main changes that will take effect in this solicitation cycle are as follows:

1. Implementation of an STTR "Fast Track" for projects which obtain outside financing (see Section 4.4 of this solicitation).

The Department's STTR program will feature a new high-priority STTR fast track. To qualify for the fast track, small companies and their research institution partners ("program participants") must, during their Phase I projects, identify independent third-party investors that will match both Phase II STTR funding and interim STTR funding (between Phases I and II), in cash, at the matching rates described in Section 4.4. Participants which obtain such third-party investments and thereby qualify for the STTR fast track will receive (subject to the qualifications described in Section 4.4 and Congressional reauthorization of STTR for 1997): (1) interim STTR funding between Phases I and II, (2) the Department's highest priority for Phase II funding, and (3) an expedited Phase II selection decision and award.

To enable potential third-party investors to identify Phase I projects in which to invest, the Department will electronically post the abstracts of all selected Phase I awards at the electronic addresses listed in Section 1.6(b) of this solicitation, shortly after the awards are made.

2. Reduction of delays in the STTR process.

All component STTR programs within the Department will reduce the time interval between proposal receipt and award to an average of four months in Phase I and an average of six months in Phase II.

3. Opportunity for program participants to ask technical questions about solicitation topics.

Approximately six weeks before each STTR or SBIR solicitation opens, all solicitation topics will be pre-released electronically at the locations listed in Section 1.6(b) of this solicitation, along with the names of topic authors or other technical experts and their phone numbers. This pre-release will give program participants an opportunity to ask technical questions about specific solicitation topics by telephone before the solicitation opens. (The Air

Force laboratories also issue their pre-releases in hard copy, at an earlier date -- see Section 8, page AF-1.)

Once a solicitation opens, telephone questions will no longer be accepted, and program participants may ask written questions through the STTR/SBIR Interactive Topic Information System (SITIS -- described in Section 7.2), in which the questioner and respondent remain anonymous and all questions and answers are posted electronically for general viewing. The SITIS service opens at the same time as the pre-release and closes to new questions approximately 30 days before the solicitation closes.

Note that the pre-release and SITIS services should only be used to ask technical questions about specific solicitation topics, and that general questions about the STTR program should be directed to the STTR hotline (800-382-4634).

4. Other changes.

- To ensure that STTR participants represent viable partnerships between small businesses and research institutions, each participant must certify that, at the time of an STTR award, the small business concern will have at least one employee in a management position whose primary employment is with the small business and who is not also employed by the research institution (see Section 3.4 introduction).

- To assist participants in negotiating STTR and SBIR contracts, we will post model Phase I and Phase II contracts at the electronic addresses listed in Section 1.6(b), starting in early 1996.

- The Company Commercialization Report requirement has been modified to more accurately measure companies' success in commercializing previous STTR and SBIR projects (see Section 3.4(n)).

- Starting with this solicitation, participants will be asked to briefly explain their commercialization strategies in their Phase I and Phase II proposals (see Section 3.4(h)).

- The Department currently maintains an STTR/SBIR hotline (800-382-4634) to answer general questions about the parameters of the STTR and SBIR programs. Starting in early 1996, we will begin increasing the capability of our hotline to address advanced questions in such areas as: proposal preparation strategy, contract negotiation, government accounting requirements, patenting, and financing strategies.

We believe that these changes represent a major step forward for the STTR program, for the Department of Defense, and for the U.S. economy. We look forward to your participation in the program.

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DOD PROGRAM SOLICITATION FOR SMALL BUSINESS TECHNOLOGY TRANSFER

1.0 PROGRAM DESCRIPTION

1.1 Introduction

The Army, Navy, Air Force, Advanced Research Projects Agency (ARPA), and Ballistic Missile Defense Organization (BMDO), hereafter referred to as DoD Components, invite small business firms and research institutions to jointly submit proposals under this solicitation for the Small Business Technology Transfer (STTR) program. The STTR Program is a pilot program under which awards are made to small business concerns for cooperative research and development, conducted jointly by a small business and a research institution, through a uniform process having three phases. STTR, although modelled substantially on the Small Business Innovation Research (SBIR) Program, is a separate program and is separately financed. Subject to availability of funds, DoD Components will support high quality cooperative research and development proposals of innovative concepts to solve the listed defense-related scientific or engineering problems, especially those concepts that also have high potential for commercialization in the private sector.

The STTR Program is designed to provide a strong incentive for small companies and researchers at research institutions, i.e., non-profit research institutions, contractor-operated federally funded research and development centers (FFRDCs), and universities, to work together as a team to move ideas from the laboratory to the marketplace, to foster high-tech economic development, and to address the technological needs of our armed forces. (See Appendix F)

Partnerships between small businesses and Historically Black Colleges or Universities (HBCUs) or Minority Institutions (MIs) are encouraged, although no special preference will be given to STTR proposals from such offerors.

The Federal STTR Program is mandated by Public Law 102-564. The basic design of the DoD STTR Program is in accordance with the Small Business Administration (SBA) STTR Policy Directive of 1993. The DoD Program presented in this solicitation strives to encourage scientific and technical innovation in areas specifically identified by DoD Components. The guidelines presented in this solicitation incorporate and exploit the flexibility of the SBA Policy Directive to encourage proposals based on scientific and technical approaches most likely to yield results important to DoD and the private sector.

1.2 Three Phase Program

This program solicitation is issued pursuant to the Small Business Research and Development Enhancement Act of 1992, PL 102-564. Phase I is to determine the scientific, technical and commercial merit and feasibility of the proposed cooperative effort and the quality of performance of the small business concern with a relatively small investment before consideration of future DoD support in Phase II. Several different proposed solutions to a given topic may be funded. Proposals will be evaluated on a competitive basis giving primary consideration to the scientific and technical merit of the proposal along with its potential for commercialization. Phase I awards are typically up to $100,000 in size over a period not to exceed one year.

Subsequent Phase II awards will be made to firms on the basis of results of their Phase I effort and the scientific, technical merit and commercial potential of their Phase II proposal. Phase II awards are typically up to $500,000 in size over a period generally not to exceed 24 months (subject to negotiation). Phase II is the principal research or research and development effort and is expected to produce a well-defined deliverable product or process.

Under Phase III, the small business is expected to use non-federal capital to pursue private sector applications of the research or development. Also, under Phase III, federal agencies may award non-STTR funded follow-on contracts for products or processes which meet the mission needs of those agencies.

DoD is not obligated to make any awards under either Phase I, II, or III. DoD is not responsible for any monies expended by the proposer before award of any contract.

1.3 Follow-On Funding

In addition to supporting scientific and engineering research and development, another important goal of the program is conversion of DoD-supported research or research and development into commercial products. Proposers are encouraged to obtain a contingent commitment for private or non-STTR follow-on funding prior to Phase II. This commitment may be contingent upon the DoD supported research or development meeting some specific technical objectives in Phase II which if met, would justify non-federal funding to pursue further development for commercial purposes in Phase III. *Note that when several Phase II proposals receive evaluations being of approximately equal merit, proposals that*

demonstrate such a commitment for follow-on funding will receive extra consideration during the evaluation process.

The recipient will be permitted to obtain commercial rights to any invention made in either Phase I or Phase II, subject to the patent policies as stated in Section 5.7.

1.4 Eligibility and Limitation

Each proposer must qualify as a small business for research or research and development purposes as defined in Section 2.3 and certify to this on the Cover Sheet (Appendix A) of the proposal. In addition, a minimum of 40 percent of each STTR project must be carried out by the small business concern and a minimum of 30 percent of the effort performed by the research institution, as defined in Section 2.4.

A small business concern must negotiate a written agreement between the small business and the research institution allocating intellectual property rights and rights to carry out follow-on research, development, or commercialization (see Reference A).

At the time of award of a Phase I or Phase II contract, the small business concern must have at least one employee in a management position whose primary employment is with the small business and who is not also employed by the research institution. Primary employment means that more than one half of the employee's time is spent with the small business

For both Phase I and Phase II, the research or research and development work must be performed by the small business concern and research institution in the United States. "United States" means the fifty states, the Territories and possessions of the United States, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, the Trust Territory of the Pacific Islands, and the District of Columbia.

Joint ventures and limited partnerships are permitted for the small business portion, provided that the entity created qualifies as a small business in accordance with the Small Business Act, 15 USC 631, and the definition included in Section 2.3.

1.5 Conflicts of Interest

Awards made to firms owned by or employing current or previous Federal Government employees could create conflicts of interest for those employees in violation of 18 USC and 10 USC 2397. Such proposers should contact the cognizant Ethics Counsellor of the DoD Component for further guidance.

1.6 Contact with DoD

a. General Information. General information questions pertaining to proposal instructions contained in this solicitation should be directed to:

STTR Coordinator
U.S. Department of Defense
OSD/SADBU - The Pentagon, Room 2A338
Washington, DC 20301-3061
SBIR/STTR Information Hotline: (800) 382-4634

Other non-technical questions pertaining to a specific DoD Component should be directed in accordance with instructions given at the beginning of that DoD Component's topics in Section 8.0 of this solicitation. Oral communications with DoD Components regarding the technical content of this solicitation during the Phase I proposal preparation periods are prohibited for reasons of competitive fairness.

b. Requests for Copies of DoD STTR Solicitation. *To remain on the DoD SBIR/STTR Mailing list, send in the Mailing List form (Reference E) to DTIC.* Additional copies of this solicitation may be ordered from:

Defense Technical Information Center
Attn: DTIC/STTR
8725 John J Kingman Rd, Suite 0944
Ft. Belvoir, VA 22060-6218
(800) 363-7247 (800 DOD-SBIR)

This solicitation is also available on floppy diskette (in Word Perfect) from DTIC for a nominal processing fee. DoD SBIR and STTR solicitations can be access via Internet through DTIC and NTTC.

DTIC	www	http://www.dtic.dla.mil/dtic/sbir
	gopher	gopher.dtic.dla.mil
	ftp	asc.dtic.dla.mil
NTTC	www	http://www.nttc.edu
	ftp/telnet	iron.nttc.edu

It can also be obtained electronically using Business Gold, the National Technology Transfer Center's bulletin board system. Connect by dialing (304) 243-2560 for high speed modems (9600+) or (304) 243-2561 for 1200-2400 baud modems and logging in as guest. For more information on the NTTC electronic bulletin board system contact:

National Technology Transfer Center
Wheeling Jesuit College
316 Washington Ave
Wheeling, WV 26003
(800) 678-6882

c. Outreach Program. The DoD holds three National SBIR/STTR Conferences a year and participates in many state-organized conferences for small business. We have a special outreach effort to socially and economically disadvantaged firms and to small companies that are negatively affected by the Defense down-sizing.

2.0 DEFINITIONS

The following definitions apply for the purposes of this solicitation:

2.1 Research or Research and Development. Systematic study and experimentation directed toward greater knowledge or understanding of the subject studied or toward applying new knowledge to meet a recognized need.

2.2 Cooperative Research and Development. For the purposes of the STTR Program this means research and development conducted jointly by a small business concern and a research institution in which not less than 40 percent of the work is performed by the small business concern, and not less than 30 percent of the work is performed by the research institution.

2.3 Small Business Concern. A small business concern is one that, at the time of award of a Phase I or Phase II contract:

a. Is independently owned and operated and organized for profit, is not dominant in the field of operation in which it is proposing, and has its principal place of business located in the United States;

b. Is at least 51% owned, or in the case of a publicly owned business, at least 51% of its voting stock is owned by United States citizens or lawfully admitted permanent resident aliens;

c. Has, including its affiliates, a number of employees not exceeding 500, and meets the other regulatory requirements found in 13 CFR 121. Business concerns, other than investment companies licensed, or state development companies qualifying under the Small Business Investment Act of 1958, 15 USC 661, et seq., are affiliates of one another when either directly or indirectly (1) one concern controls or has the power to control the other; or (2) a third party or parties controls or has the power to control both. Control can be exercised through common ownership, common management, and contractual relationships. The term "affiliates" is defined in greater detail in 13 CFR 121.3-2(a). The term "number of employees" is defined in 13 CFR 121.3-2(t). Business concerns include, but are not limited to, any individual, partnership, corporation, joint venture, association or cooperative.

2.4 Research Institution. Any organization that is:

a. A university.

b. A nonprofit institution as defined in section 4(5) of the Stevenson-Wydler Technology Innovation Act of 1980.

c. A contractor-operated federally funded research and development center, as identified by the National Science Foundation in accordance with the government-wide Federal Acquisition Regulation issued in accordance with section 35(c)(1) of the Office of Federal Procurement Policy Act. (See Appendix F for a list of eligible FFRDCs.)

2.5 Socially and Economically Disadvantaged Small Business. A small business that is at the time of award of a Phase I or Phase II contract:

a. At least 51% owned by an Indian tribe or a native Hawaiian organization, or one or more socially and economically disadvantaged individuals, and

b. Whose management and daily business operations are controlled by one or more socially and economically disadvantaged individuals.

A socially and economically disadvantaged individual is defined as a member of any of the following groups: Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Subcontinent-Asian Americans, or other groups designated by SBA to be socially disadvantaged.

2.6 Women-Owned Small Business. A small business concern that is at least 51% owned by a woman or women who also control and operate it. "Control" in this context means exercising the power to make policy decisions. "Operate" in this context means being actively involved in the day-to-day management.

2.7 Funding Agreement. Any contract, grant, or cooperative agreement entered into between any federal agency and any small business concern for the performance of experimental, developmental, or research work funded in whole or in part by the federal government. *Only the contract method will be used by DoD components for all STTR awards.*

2.8 Subcontract. A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by a Federal Government contract awardee calling for supplies or services required solely for the performance of the original contract. This includes consultants.

2.9 Commercialization. The process of developing markets and producing and delivering products for sale (whether by the originating party or by others); as used here, commercialization includes both government and private sector markets.

2.10 HBCU/MI. A list of the Historically Black Colleges and Universities (HBCU) and Minority Institutions (MI) is available through DTIC (see section 1.6.b).

3.0 PROPOSAL PREPARATION INSTRUCTIONS AND REQUIREMENTS

3.1 Proposal Requirements

A proposal to any DoD Component under the STTR Program is to provide sufficient information to persuade the DoD Component that the proposed work represents an innovative approach to the investigation of an important scientific or engineering problem and is worthy of support under the stated criteria.

The quality of the scientific, technical or commercial content of the proposal will be the principal basis upon which proposals will be evaluated. The proposed research or research and development must be responsive to the chosen topic. Any small business contemplating a bid for work on any specific topic should determine that (a) the technical approach has a reasonable chance of meeting the topic objective, (b) this approach is innovative, not routine, and (c) the firm and research institution team have the capability to implement the technical approach, i.e. have or can obtain people and equipment suitable to the task.

It should be recognized that while the STTR Program requires a small business and a research institution to undertake a project cooperatively, the Federal contract is with the small business. The small business, and not the research institution, is to provide satisfactory evidence that it will exercise management direction and control of the performance of the STTR funding agreement. Regardless of the proportion of the work or funding of each of the performers under the contract, the small business is to be primary contractor with overall responsibility for its performance.

Those responding to this solicitation should note the proposal preparation tips listed below:

- Read and follow all instructions contained in this solicitation.
- Use the technical information services from DTIC and other information assistance organizations (Section 7.1 - 7.4).
- Mark proprietary information as instructed in Section 5.5.
- Limit your proposal to 25 pages (excluding company commercialization report).
- Have an agreement between the small business and research institution in place prior to proposal submission (see Section 3.4.o and Reference A).
- Use a type size no smaller than 12 pitch or 11 point.
- Don't include proprietary or classified information in the project summary (Appendix B).
- Include a Red Copy of Appendix A and Appendix B as part of the Original of each proposal.
- Do not use a proportionally spaced font on Appendix A and Appendix B.
- Include a company commercialization report listing SBIR and STTR Phase I and Phase II projects and the commercialization status of Phase II projects (see details in Section 3.4.n)

3.2 Proprietary Information

If information is provided which constitutes a trade secret, proprietary, commercial or financial information, confidential personal information, or data affecting the national security, it will be treated in confidence to the extent permitted by law, provided it is clearly marked in accordance with Section 5.5.

3.3 Limitations on Length of Proposal

This solicitation is designed to reduce the investment of time and cost to small firms in preparing a formal proposal. Those who wish to respond must submit a direct, concise, and informative research or research and development proposal of no more than 25 pages, excluding commercialization record summary, (no type smaller than 11 point or 12 pitch on standard 8½" X 11" paper with one (1) inch margins, 6 lines per inch), *including Proposal Cover Sheet (Appendix A), Project Summary (Appendix B), Cost Proposal (Appendix C), and any enclosures or attachments.* Promotional and non-project related discussion is discouraged. Cover all items listed below in Section 3.4 in the order given. The space allocated to each will depend on the problem chosen and the principal investigator's approach. In the interest of equity, proposals in excess of the 25-page limitation (including attachments, appendices, or references, but excluding commercialization record summary) will not be considered for review or award.

3.4 Phase I Proposal Format

All pages shall be consecutively numbered and the ORIGINAL of each proposal must contain a completed red copy of Appendix A and Appendix B. Through the signature of the Corporate Official of the small business concern and the signature of the appropriate official of the research institution on Appendix A, the small business concern AND the research institution certify jointly that:

(1) The proposing firm meets the definition of small business concern found in section 2.3, the proposing institution meets the definition of research institution found in section 2.4, and the proposed STTR project meets the definition of cooperative research and development as defined in section 2.2, and

(2) Regardless of the proportion of the proposed project to be performed by each party, the small business concern will be the primary party that will exercise management direction and control of the performance of the STTR award.
(3) An agreement has been signed by both the small business and research institution. (see section 3.4.o)
(4) At the time of award, the small business concern will have at least one employee in a management position whose primary employment is with the small business and who is not also employed by the research institution.

If the research institution is a contractor-operated Federally funded research and development center, the appropriate official signing for the contractor-operated Federally funded research and development center certifies additionally that it:

(5) Is free from organizational conflicts of interests relative to the STTR program;
(6) Did not use privileged information gained through work performed for an STTR agency or private access to STTR agency personnel in the development of this STTR proposal; and
(7) Used outside peer review as appropriate, to evaluate the proposed project and its performance therein.

a. Cover Sheet. Complete RED COPY of Appendix A, photocopy the completed form, and use a copy as Page 1 of each additional copy of your proposal.

b. Project Summary. Complete RED COPY of Appendix B, photocopy the completed form, and use a copy as Page 2 of each additional copy of your proposal. The technical abstract should include a brief description of the project objectives and description of the effort. Anticipated benefits and commercial applications of the proposed research or research and development should also be summarized in the space provided. Project Summaries of proposals selected for award will be publicly released and, therefore, should not contain proprietary or classified information.

c. Identification and Significance of the Problem or Opportunity. Define the specific technical problem or opportunity addressed and its importance. (Begin on Page 3 of your proposal.)

d. Phase I Technical Objectives. Enumerate the specific objectives of the Phase I work, including the questions it will try to answer to determine the feasibility of the proposed approach.

e. Phase I Work Plan. Provide an explicit, detailed description of the Phase I approach. The plan should indicate what is planned, how and where the work will be carried out, a schedule of major events, and the final product to be delivered. Phase I effort should attempt to determine the technical feasibility of the proposed concept. The methods planned to achieve each objective or task should be discussed explicitly and in detail. This section should be a substantial portion of the total proposal.

f. Related Work. Describe significant activities directly related to the proposed effort, including any conducted by the principal investigator, the proposing firm, consultants, or others. Describe how these activities interface with the proposed project and discuss any planned coordination with outside sources. The proposal must persuade reviewers of the proposer's awareness of the state-of-the-art in the specific topic.

Describe previous work not directly related to the proposed effort but similar. Provide the following: (1) short description, (2) client for which work was performed (including individual to be contacted and phone number), and (3) date of completion.

g. Relationship with Future Research or Research and Development.
(1) State the anticipated results of the proposed approach if the project is successful.
(2) Discuss the significance of the Phase I effort in providing a foundation for Phase II research or research and development effort.

h. Potential Post Applications. Describe, in approximately one page, your company's strategy for converting your proposed STTR research into a product or products with widespread commercial use in private sector and/or military markets.

i. Key Personnel. Identify key personnel who will be involved in the Phase I effort including information on directly related education and experience. A concise resume of the principal investigator, including a list of relevant publications (if any), must be included.

j. Facilities/Equipment. Describe available instrumentation and physical facilities necessary to carry out the Phase I effort. Items of equipment to be purchased (as detailed in Appendix C) shall be justified under this section. Also state whether or not the facilities where the proposed work will be performed meet environmental laws and regulations of federal, state (name) and local governments for, but not limited to, the following groupings: airborne emissions, waterborne effluents, external radiation levels, outdoor noise, solid and bulk waste disposal practices, and handling and storage of toxic and hazardous materials.

k. Subcontractors/Consultants. All subcontractors, including the research institution partner, must be identified and described according to the guidelines in Appendix C. The STTR program may only make awards to small businesses therefore the research institution must have a subcontracting arrangement with the small business. More than one subcontractor is allowed; however, the small business must perform at least 40% of the effort and the research institution listed on the Appendix A must perform at least 30% of the work. Subcontractor costs must be detailed at the same level as prime contractor costs in accordance with Appendix C (in regards to labor, travel, equipment, etc.). If consultants are involved, it should be described in detail and identified in Appendix C.

l. Prior, Current, or Pending Support of Similar Proposals or Awards. *Warning* -- While it is permissible, with proposal notification, to submit identical proposals or proposals containing a significant amount of essentially equivalent work for consideration under numerous federal program solicitations, it is unlawful to enter into contracts or grants requiring essentially equivalent effort. If there is any question concerning this, it must be disclosed to the solicitating agency or agencies before award.

If a proposal submitted in response to this solicitation is substantially the same as another proposal that has been funded, is now being funded, or is pending with another federal agency or DoD Component or the same DoD Component, the proposer must indicate action on Appendix A and provide the following information:

(1) Name and address of the federal agency(s) or DoD Component to which a proposal was submitted, will be submitted, or from which an award is expected or has been received.
(2) Date of proposal submission or date of award.
(3) Title of proposal.
(4) Name and title of principal investigator for each proposal submitted or award received.
(5) Title, number, and date of solicitation(s) under which the proposal was submitted, will be submitted, or under which award is expected or has been received.
(6) If award was received, state contract number.
(7) Specify the applicable topics for each STTR proposal submitted or award received.

Note: If Section 3.4.l does not apply, state in the proposal "No prior, current, or pending support for proposed work."

m. Cost Proposal. Complete the cost proposal in the form of Appendix C for the Phase I effort only. Some items of Appendix C may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item. What matters is that enough information be provided to allow the DoD Component to understand how the proposer plans to use the requested funds if the contract is awarded.

(1) List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
(2) Special tooling and test equipment and material cost may be included under Phases I and II. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the government or acquired with government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.
(3) Cost for travel funds must be justified and related to the needs of the project.
(4) Cost sharing is permitted for proposals under this solicitation; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a proposal.

n. Company Commercialization Report. Submit a brief report on the small business concern's activity in commercializing any previous SBIR or STTR research projects, using the following format:

(1) list the name of awarding federal agency, date of award, contract number, topic or subtopic, title, and award amount for each Phase I and Phase II project, and
(2) list, for each Phase II project,
    (a) the sources and amounts of non-STTR/non-SBIR funding received for Phase III, and
    (b) the revenue from sales of new products in Phase III.

    Apportion the Phase III funding and sales revenue among the various Phase II projects without double-counting.

This required proposal information shall not be counted toward proposal pages count limitations.

o. Agreement between the Small Business and Research Institution. The small business, before submitting an STTR proposal, must negotiate a written agreement between the small business and the research institution allocating intellectual property rights and rights, if any, to carry out follow-on research, development, or commercialization. The small business must submit this agreement to the awarding agency on request and certify in all proposals that the agreement is satisfactory to the small business. The agreement should, as a minimum, state:

(1) specifically the degree of responsibility and ownership of any product, process, or other invention or innovation resulting from the cooperative research. The degree of responsibility shall include responsibility for expenses and liability, and the degree of ownership shall also include the specific rights to revenues and profits.
(2) which party may obtain U.S. or foreign patents or otherwise protect any inventions resulting from the cooperative research.
(3) which party has the right to any continuation of research including non-STTR follow-on awards.

See Reference A for a guideline or model for such an agreement.

The Federal government will not normally be party to any agreement between the small business concern and the research institution. Nothing in the agreement is to conflict with any provisions setting forth the respective rights of the United States and the small business with respect to intellectual property rights and with respect to any right to carry out follow-on research. All agreements between the small business and the research institution cooperating in the STTR projects, or any business plans reflecting agreements and responsibilities between the parties during the performance of Phase I or II, or for the commercialization of the resulting technology, shall reflect the controlling position of the small business.

3.5 Bindings

Do not use special bindings or cover. Staple the pages in the upper left hand corner of each proposal.

3.6 Phase II Proposal

This solicitation is for Phase I only. A Phase II proposal can be submitted only by a Phase I awardee and only in response to a request from the agency; that is, Phase II is not initiated by a solicitation. Each proposal must contain a Red Cover Sheet (Appendix A) and a Red Project Summary Sheet (Appendix B). Copies of Appendices along with instructions regarding Phase II proposal preparation and submission will be provided by the DoD Components to all Phase I winners at time of Phase I contract award.

4.0 METHOD OF SELECTION AND EVALUATION CRITERIA

4.1 Introduction

Phase I proposals will be evaluated on a competitive basis and will be considered to be binding for six (6) months from the date of closing of this solicitation unless offeror states otherwise. If selection has not been made prior to the proposal's expiration date, offerors will be requested as to whether or not they want to extend their proposal for an additional period of time. Proposals meeting stated solicitation requirements will be evaluated by scientists or engineers knowledgeable in the topic area. Proposals will be evaluated first on their relevance to the chosen topic. Those found to be relevant will then be evaluated using the criteria listed in Section 4.2. Final decisions will be made by the DoD Component based upon these criteria and consideration of other factors including possible duplication of other work, and program balance. A DoD Component may elect to fund several or none of the proposed approaches to the same topic. In the evaluation and handling of proposals, every effort will be made to protect the confidentiality of the proposal and any evaluations. There is no commitment by the DoD Components to make any awards on any topic, to make a specific number of awards or to be responsible for any monies expended by the proposer before award of a contract.

For proposals that have been selected for contract award, a Government Contracting Officer will draw up an appropriate contract to be signed by both parties before work begins. Any negotiations that may be necessary will be conducted between the offeror and the Government Contracting Officer. It should be noted that only a duly appointed contracting officer has the authority to enter into a contract on behalf of the U.S. Government.

Phase II proposals will be subject to a technical review process similar to Phase I. Final decisions will be made by DoD Components based upon the scientific and technical evaluations and other factors, including a commitment for Phase III follow-on funding, the possible duplication with other research or research and development, program balance, budget limitations, and the potential of a successful Phase II effort leading to a product of continuing interest to DoD and with high private sector commercial potential.

Upon written request and after final award decisions have been announced, a debriefing will be provided to unsuccessful offerors on their proposals.

4.2 Evaluation Criteria - Phase I

The DoD Components plan to select for award those proposals offering the best value to the government and the nation considering the following factors.

a. The soundness and technical merit of the proposed approach and its incremental progress toward topic or subtopic solution

b. The potential for commercial (government or private sector) application and the benefits expected to accrue from this commercialization

c. The adequacy of the proposed effort for the fulfillment of requirements of the research topic

d. The qualifications of the proposed principal/key investigator, supporting staff and researchers from the research institution. Qualifications include not only the ability to perform the research and development but also the ability to commercialize the results.

Where evaluations are essentially equal in merit, cost to the government will be considered in determining the successful offeror.

Reviewers will base their conclusions only on information contained in the proposal. It cannot be assumed that reviewers are acquainted with the firm or key individuals or any referenced experiments. Relevant supporting data such as journal articles, literature, including government publications, etc., should be contained or referenced in the proposal.

4.3 Evaluation Criteria - Phase II

The Phase II proposal will be reviewed for overall merit based upon the criteria below.

a. The soundness and technical merit of the proposed approach and its incremental progress toward topic or subtopic solution

b. The potential for commercial (government or private sector) application and the benefits expected to accrue from this commercialization

c. The adequacy of the proposed effort for the fulfillment of requirements of the research topic

d. The qualifications of the proposed principal/key investigator, supporting staff and researchers from the research institution. Qualifications include not only the ability to perform the research and development but also the ability to commercialize the results.

A proposal's commercial potential can be evidenced by:

(1) the small business concern's record of commercializing STTR or other research,
(2) the existence of second phase funding commitments from private sector or non-STTR government funding sources,
(3) the existence of third phase follow-on commitments for the subject of the research, or
(4) the presence of other indicators of commercial potential of the idea.

The reasonableness of the proposed costs of the effort to be performed will be examined to determine those proposals that offer the best value to the government. Where technical evaluations are essentially equal in merit, cost to the government will be considered in determining the successful offeror.

The follow-on funding commitment must provide that a specific amount of Phase III funds will be made available to or by the small business and indicate the dates the funds will be made available. It must also contain specific technical objectives which, if achieved in Phase II, will make the commitment exercisable by the small business. The terms cannot be contingent upon the obtaining of a patent due to the length of time this process requires. The funding commitment shall be submitted with the Phase II proposal.

Phase II proposal evaluation may include on-site evaluations of the Phase I effort by government personnel.

4.4 STTR Fast Track

a. In General. On a two-year pilot basis, beginning with this solicitation, the DoD STTR program will implement a fast-track STTR process for companies which, during their Phase I projects, attract independent third-party investors that will match both phase II STTR funding and interim STTR funding (between Phases I and II). As discussed in detail below, companies which obtain such third-party matching funds and thereby qualify for the STTR fast track will receive (subject to the qualifications described herein):

(1) Interim funding on the order of $40,000 (generally, $30,000 to $50,000) between Phases I and II;
(2) The Department's highest priority for Phase II STTR funding; and
(3) An expedited Phase II selection decision and, upon selection, an expedited Phase II award.

b. How To Qualify for the STTR Fast Track. To qualify for the STTR fast track, a company must submit the following items, at least 60 days prior to completion of its Phase I project, to the same address the company would send its Phase II proposal (see back of Appendix D):

(1) A completed fast-track application form, found at Appendix D. (Please also send a copy to OSD STTR -- see back of Appendix D.)
(2) A commitment letter from an independent third-party investor -- such as another company, a venture capital firm, an "angel" investor, or a non-STTR/non-SBIR government program -- indicating that the third-party investor will match both interim and Phase II STTR funding, in cash, contingent upon the company's receipt of interim and Phase II STTR funds.

The matching rates are as follows:

(a) For companies that have 10 or fewer employees and have never received a Phase II STTR or SBIR award from DoD or any other federal agency, the minimum matching rate is 25 cents for every STTR dollar. (For example, if such a company receives an interim STTR award of $40,000 and a Phase II award of $500,000, it must obtain matching funds of $10,000 and $125,000 respectively for the two awards.)

(b) For companies that have received 5 or more Phase II STTR or SBIR awards from the federal government (including DoD), the minimum matching rate is 1 dollar for every STTR dollar. (For example, if such a company receives an interim STTR award of $40,000 and a Phase II award of $500,000, it must obtain matching funds of $40,000 and $500,000 respectively for the two awards.)

(c) For all other companies, the minimum matching rate is 50 cents for every STTR dollar. (For example, if such a company receives an interim STTR award of $40,000 and a Phase II award of $500,000, it must obtain matching funds of $20,000 and $250,000 respectively for the two awards.)

The commitment letter should indicate that the third-party funds will pay for work that is connected to the particular STTR project, and should describe the general nature of that work. The work funded by the third-party investor may be additional research and development on the project or, alternatively, it may be other activity related to the project (e.g., marketing) that is outside the scope of the STTR contract.

(3) A concise statement of work for the interim STTR effort (if an interim option was not previously negotiated on the Phase I contract). This statement of work should be under 4 pages in length.

(4) A concise report on the status of the Phase I project, if required by the DoD component that is funding the project. This report should be under 4 pages in length.

In addition:

(1) The company must submit its Phase II proposal no later than 30 days prior to completion of its Phase I project, unless a different deadline for fast-track Phase II proposals is specified in the Phase II proposal instructions of the sponsoring DoD component.

(2) If the company receives an interim and/or Phase II STTR award from DoD, its matching funds must arrive before corresponding installments of STTR funds are released. For example, a company whose matching rate is 50 cents to the dollar must certify, to the satisfaction of its DoD contracting officer, that it has received $20,000 in cash from the third-party investor before the contracting officer will release $40,000 in interim STTR funds. Similarly, the company must certify that it has received $30,000 in third-party funds before the contracting officer will release a $60,000 installment of Phase II funds. (A simple letter stating that the third-party funds have arrived, with an attached copy of the bank statement, should generally suffice.)

Failure to meet these conditions in their entirety and within the time frames indicated will disqualify a company from participation in the STTR fast track. The company will still be eligible to compete for a Phase II STTR award through the regular procedures.

c. Benefits of Qualifying for the Fast Track. A company which qualifies for the fast track will:

(1) Receive interim STTR funding on the order of $40,000 (generally, $30,000 to $50,000), commencing at the end of Phase I.

Note: It is DoD policy that the vast majority of Phase I contracts which qualify for the fast track will receive interim STTR funding. However, the DoD contracting office has the discretion and authority, in any particular instance, to deny interim funding to a Phase I contractor when doing so is in the government's interest (e.g., when the project no longer meets a military need).

(2) Receive the Department's highest priority for Phase II award. Specifically, it is DoD policy that the percentage of fast-track Phase I projects which receive Phase II awards will be significantly higher than the overall percentage of Phase I projects which receive Phase II awards.

(3) Receive notification of whether it has been selected for a Phase II award, within an average of two months -- and, in all cases, no longer than ten weeks -- after the completion of its Phase I project.

(4) If selected, receive its Phase II award within an average of five months from the completion of its Phase I project.

5.0 CONTRACTUAL CONSIDERATIONS

Note: Eligibility and Limitation Requirements (Section 1.4) Will Be Enforced

5.1 Awards (Phase I)

a. Number of Phase I Awards. The number of Phase I awards will be consistent with the agency's RDT&E budget, the number of anticipated awards for interim Phase I modifications, and the number of anticipated Phase II contracts. No Phase I contracts will be awarded until all qualified proposals (received in accordance with Section 6.2) on a specific topic have been evaluated. All proposers will be notified of selection/non-selection status for a Phase I award no later than October 4, 1996. The name of those firms selected for awards will be announced. *The DoD Components anticipate making 75 Phase I awards from this solicitation.*

b. Type of Funding Agreement. All winning proposals will be funded under negotiated contracts and may include a fee or profit. The firm fixed price or cost plus fixed fee type contract will be used for all Phase I projects (see Section 5.4). *Note: The firm fixed price contract is the preferred type for Phase I.*

c. Average Dollar Value of Awards. DoD Components will make Phase I awards to small businesses typically on a one-half person-year effort over a period generally not to exceed one year (subject to negotiation). PL 102-564 allows agencies to award Phase I contracts up to $100,000 without justification. Where applicable, specific funding instructions are contained in Section 8 for each DoD Component.

5.2 Awards (Phase II)

a. Number of Phase II Awards. The number of Phase II awards will depend upon the results of the Phase I efforts and the availability of funds. *The DoD anticipates that approximately 40 percent of its Phase I awards will result in Phase II projects.*

b. Type of Funding Agreement. Each Phase II proposal selected for award will be funded under a negotiated contract and may include a fee or profit.

c. Project Continuity. Phase II proposers who wish to maintain project continuity must submit proposals no later than 30 days prior to the expiration date of the Phase I contract and must identify in their proposal the work to be performed for the first four months of the Phase II effort and the costs associated therewith. *These Phase II proposers may be issued a modification to the Phase I contract, at the discretion of the government*, covering an interim period not to exceed four months for preliminary Phase II work while the total Phase II proposal is being evaluated and a contract is negotiated. This modification would normally become effective at the completion of Phase I or as soon thereafter as possible. Funding, scope of work, and length of performance for this interim period will be subject to negotiations. Issuance of a contract modification for the interim period does not commit the government to award a Phase II contract. See special instructions for each DoD Component in Section 8. *(For Phase I projects which qualify for the STTR Fast Track, the instructions in Section 4.4 supersede those in this paragraph.)*

d. Average Dollar Value of Awards. Phase II awards will be made to small businesses based on results of the Phase I efforts and the scientific, technical, and commercial merit of the Phase II proposal. Average Phase II awards will typically cover 2 to 5 person-years of effort over a period generally not to exceed 24 months (subject to negotiation). PL 102-564 states that the Phase II awards may be up to $500,000 each without justification. Specific instructions are provided by each DoD Component in Section 8.

5.3 Reports

a. Content. A final report is required for each Phase I project. The report must contain in detail the project objectives, work performed, results obtained, and estimates of technical feasibility. A completed SF 298, "Report Documentation Page", will be used as the first page of the report. In addition, Monthly status and progress reports may be required by the DoD agency. (A blank SF 298 is provided in Section 9.0, Reference D.)

b. Preparation.

(1) To avoid duplication of effort, language used to report Phase I progress in a Phase II proposal, if submitted, may be used verbatim in the final report with changes to accommodate results after Phase II proposal submission and modifications required to integrate the final report into a self-contained comprehensive and logically structured document.

(2) Block 12a (Distribution/Availability Statement) of the SF298, "Report Documentation Page" in each unclassified final report must contain one of the following statements:

(a) Approved for public release; distribution unlimited.

(b) Distribution authorized to U.S. Government Agencies only; contains proprietary information.

(3) Block 13 (Abstract) of the SF 298, "Report Documentation Page") must include as the first sentence, "Report developed under STTR contract". The abstract must identify the purpose of the work and briefly describe the work carried out, the finding or results and the potential applications of the effort. Since the abstract will be published by the DoD, it must not contain any proprietary or classified data.
(4) Block 14 (Subject Terms) of the SF 298 must include the term "STTR Report".

c. Submission. SIX COPIES of the final report on each Phase I project shall be submitted to the DoD in accordance with the negotiated delivery schedule. Delivery will normally be within thirty days after completion of the Phase I technical effort. One copy of each unclassified report shall be delivered directly to the DTIC, ATTN: Document Acquisition, 8725 John J Kingman Road, Suite 0944, Ft. Belvoir, VA 22060-6218.

5.4 Payment Schedule

The specific payment schedule (including payment amounts) for each contract will be incorporated into the contract upon completion of negotiations between the DoD and the successful Phase I or Phase II offeror. Successful offerors may be paid periodically as work progresses in accordance with the negotiated price and payment schedule. Phase I contracts are primarily fixed price contracts, under which monthly progress payments may be made up to 90% for small businesses and up to 95% for small disadvantaged businesses of the contract price excluding fee or profit. The contract may include a separate provision for payment of a fee or profit. Final payment will follow completion of contract performance and acceptance of all work required under the contract. Other types of financial assistance may be available under the contract.

5.5 Markings of Proprietary or Classified Proposal Information

The proposal submitted in response to this solicitation may contain technical and other data which the proposer does not want disclosed to the public or used by the government for any purpose other than proposal evaluation.

Information contained in unsuccessful proposals will remain the property of the proposer except for Appendices A and B. The government may, however, retain copies of all proposals. Public release of information in any proposal submitted will be subject to existing statutory and regulatory requirements.

If proprietary information is provided by a proposer in a proposal which constitutes a trade secret, proprietary commercial or financial information, confidential personal information or data affecting the national security, it will be treated in confidence, to the extent permitted by law, provided this information is clearly marked by the proposer with the term "confidential proprietary information" and provided that the following legend which appears on the title page (Appendix A) of the proposal is completed:

> "For any purpose other than to evaluate the proposal, this data except Appendix A and B shall not be disclosed outside the government and shall not be duplicated, used, or disclosed in whole or in part, provided that if a contract is awarded to the proposer as a result of or in connection with the submission of this data, the government shall have the right to duplicate, use or disclose the data to the extent provided in the funding agreement. This restriction does not limit the government's right to use information contained in the data if it is obtained from another source without restriction."

Any other legend may be unacceptable to the government and may constitute grounds for removing the proposal from further consideration and without assuming any liability for inadvertent disclosure. The government will limit dissemination of properly marked information to within official channels.

In addition, each page of the proposal containing proprietary data which the proposer wishes to restrict must be marked with the following legend:

> "Use or disclosure of the proposal data on lines specifically identified by asterisk (*) are subject to the restriction on the cover page of this proposal."

The government assumes no liability for disclosure or use of unmarked data and may use or disclose such data for any purpose.

In the event properly marked data contained in a proposal in response to this solicitation is requested pursuant to the Freedom of Information Act, 5 USC 552, the proposer will be advised of such request and prior to such release of information will be requested to expeditiously submit to the DoD Component a detailed listing of all information in the proposal which the proposer believes to be exempt from disclosure under the Act. Such action and cooperation on the part of the proposer will ensure that any information released by the DoD Component pursuant to the Act is properly determined.

Those proposers that have a classified facility clearance may submit classified material with their proposal. Any classified material shall be marked and handled in accordance with applicable regulations. Arbitrary and unwarranted use of this restriction is discouraged. Offerors must follow the Industrial Security Manual for Safeguarding Classified Information (DoD 5220.22M) procedures for marking and handling classified material.

5.6 Copyrights

To the extent permitted by statute, the awardee may copyright (consistent with appropriate national security considerations, if any) material developed with DoD support. DoD receives a royalty-free license for the Federal Government and requires that each publication contain an appropriate acknowledgement and disclaimer statement.

5.7 Patents

Small business firms normally may retain the principal worldwide patent rights to any invention developed with government support. The government receives a royalty-free license for its use, reserves the right to require the patent holder to license others in certain limited circumstances, and requires that anyone exclusively licensed to sell the invention in the United States must normally manufacture it domestically. To the extent authorized by 35 USC 205, the government will not make public any information disclosing a government-supported invention for a period of five years to allow the awardee to pursue a patent.

5.8 Technical Data Rights

Rights in technical data, including software, developed under the terms of any contract resulting from proposals submitted in response to this solicitation generally remain with the contractor, except that the government obtains a royalty-free license to use such technical data only for government purposes during the period commencing with contract award and ending five years after completion of the project under which the data were generated. Upon expiration of the five-year restrictive license, the government has unlimited rights in the STTR data. During the license period, the government may not release or disclose STTR data to any person other than its support services contractors except: (1) For evaluational purposes; (2) As expressly permitted by the contractor; or (3) A use, release, or disclosure that is necessary for emergency repair or overhaul of items operated by the government. See FAR clause 52.227-20, "Rights in Data - SBIR Program" and DFARS 252.227-7018, "Rights in Noncommercial Technical Data and Computer Software -- SBIR Program."

5.9 Cost Sharing

Cost sharing is permitted for proposals under this solicitation; however, cost sharing is not required nor will it be an evaluation factor in the consideration of any Phase I proposal.

5.10 Joint Ventures or Limited Partnerships

Joint ventures and limited partnerships are eligible provided the entity created qualifies as a small business as defined in Section 2.2 of this solicitation.

5.11 Research and Analytical Work

For Phase I and II, a minimum of 40 percent of the research and/or analytical effort must be performed by the proposing firm and a minimum of 30 percent performed by the research institution unless otherwise approved in writing by the contracting officer.

5.12 Contractor Commitments

Upon award of a contract, the contractor will be required to make certain legal commitments through acceptance of government contract clauses in the Phase I contract. The outline that follows is illustrative of the types of provisions required by the Federal Acquisition Regulations that will be included in the Phase I contract. This is not a complete list of provisions to be included in Phase I contracts, nor does it contain specific wording of these clauses. Copies of complete general provisions will be made available prior to award.

a. Standards of Work. Work performed under the contract must conform to high professional standards.

b. Inspection. Work performed under the contract is subject to government inspection and evaluation at all reasonable times.

c. Examination of Records. The Comptroller General (or a fully authorized representative) shall have the right to examine any directly pertinent records of the contractor involving transactions related to this contract.

d. Default. The government may terminate the contract if the contractor fails to perform the work contracted.

e. Termination for Convenience. The contract may be terminated at any time by the government if it deems termination to be in its best interest, in which case the contractor will be compensated for work performed and for reasonable termination costs.

f. Disputes. Any dispute concerning the contract which cannot be resolved by agreement shall be decided by the contracting officer with right of appeal.

g. Contract Work Hours. The contractor may not require an employee to work more than eight hours a day or forty hours a week unless the employee is compensated accordingly (that is, receives overtime pay).

h. Equal Opportunity. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin.

i. Affirmative Action for Veterans. The contractor will not discriminate against any employee or applicant for employment because he or she is a disabled veteran or veteran of the Vietnam era.

j. Affirmative Action for Handicapped. The contractor will not discriminate against any employee or applicant for employment because he or she is physically or mentally handicapped.

k. Officials Not to Benefit. No member of or delegate to Congress shall benefit from the contract.

l. Covenant Against Contingent Fees. No person or agency has been employed to solicit or secure the contract upon an understanding for compensation except bona fide employees or commercial agencies maintained by the contractor for the purpose of securing business.

m. Gratuities. The contract may be terminated by the government if any gratuities have been offered to any representative of the government to secure the contract.

n. Patent Infringement. The contractor shall report each notice or claim of patent infringement based on the performance of the contract.

o. Military Security Requirements. The contractor shall safeguard any classified information associated with the contracted work in accordance with applicable regulations.

p. American Made Equipment and Products. When purchasing equipment or a product under the STTR funding agreement, purchase only American-made items whenever possible.

5.13 Additional Information

a. General. This Program Solicitation is intended for information purposes and reflects current planning. If there is any inconsistency between the information contained herein and the terms of any resulting STTR contract, the terms of the contract are controlling.

b. Small Business Data. Before award of an STTR contract, the government may request the proposer to submit certain organizational, management, personnel, and financial information to confirm responsibility of the proposer.

c. Proposal Preparation Costs. The government is not responsible for any monies expended by the proposer before award of any contract.

d. Government Obligations. This Program Solicitation is not an offer by the government and does not obligate the government to make any specific number of awards. Also, awards under this program are contingent upon the availability of funds.

e. Unsolicited Proposals. The STTR Program is not a substitute for existing unsolicited proposal mechanisms. Unsolicited proposals will not be accepted under the STTR Program in either Phase I or Phase II.

f. Duplication of Work. If an award is made pursuant to a proposal submitted under this Program Solicitation, the contractor will be required to certify that he or she has not previously been, nor is currently being, paid for essentially equivalent work by an agency of the Federal Government.

g. Classified Proposals. If classified work is proposed or classified information is involved, the offeror to the solicitation must have, or obtain, security clearance in accordance with the Industrial Security Manual for Safeguarding Classified Information (DoD 5220.22M).

6.0 SUBMISSION OF PROPOSALS

An original plus (4) copies of each proposal or modification will be submitted, in a single package, as described below, unless otherwise stated by specific instructions in Section 8.0.

NOTE: THE ORIGINAL OF EACH PROPOSAL MUST CONTAIN A COMPLETED RED COPY OF APPENDIX A (COVER SHEET) AND APPENDIX B (PROJECT SUMMARY), AND A COMPANY COMMERCIALIZATION REPORT (see Section 3.4.n).

6.1 Address

Each proposal or modification package must be addressed to that DoD Component address which is identified for the specific topic in that Component's subsection of Section 8.0 of this solicitation.

The name and address of the offeror, the solicitation number and the topic number for the proposal must be clearly marked on the face of the envelope or wrapper.

Mailed or handcarried proposals must be delivered to the address indicated for each topic. Secured packaging is mandatory. The DoD Component cannot be responsible for the processing of proposals damaged in transit.

All copies of a proposal must be sent in the same package. Do not send separate information copies or several packages containing parts of the single proposal.

6.2 Deadline of Proposals

Deadline for receipt of proposals at the DoD Component is 2:00 p.m. local time, April 5, 1996. Any proposal received at the office designated in the solicitation after the exact time specified for receipt will not be considered unless it is received before an award is made, and: (a) it was sent by registered or certified mail not later than March 27, 1996 or (b) it was sent by mail and it is determined by the government that the late receipt was due solely to mishandling by the government after receipt at the government installation. There are no other provisions for late receipt of proposals under this solicitation.

The only acceptable evidence to establish (a) the date of mailing of a late-received proposal sent either by registered mail or certified mail is the U. S. Postal Service postmark on the wrapper or on the original receipt from the U. S. Postal Service. If neither postmark shows a legible date, the proposal shall be deemed to have been mailed late. The term postmark means a printed, stamped, or otherwise placed impression (exclusive of a postage meter machine impression) that is readily identifiable without further action as having been supplied and affixed on the date of mailing by employees of the U. S. Postal Service. Therefore, offerors should request the postal clerk to place a hand cancellation bull's-eye postmark on both the receipt and the envelope or wrapper; (b) the time of receipt at the government installation is the time-date stamp of such installation on the proposal wrapper or other documentary evidence of receipt maintained by the installation.

Proposals may be withdrawn by written notice or a telegram received at any time prior to award. Proposals may also be withdrawn in person by an offeror or his authorized representative, provided his identity is made known and he signs a receipt for the proposal. (NOTE: the term telegram includes mailgrams.)

Any modification or withdrawal of a proposal is subject to the same conditions outlined above. Any modification may not make the proposal longer than 25 pages (excluding company commercialization record). Notwithstanding the above, a late modification of an otherwise successful proposal which makes its terms more favorable to the government will be considered at any time it is received and may be accepted.

6.3 Notification of Proposal Receipt

Proposers desiring notification of receipt of their proposal must complete and include a self-addressed stamped envelope and a copy of the notification form (Reference B) in the back of this brochure. If multiple proposals are submitted, a separate form and envelope is required for each. Notification of receipt of a proposal by the government does not by itself constitute a determination that the proposal was received on time or not. The determination of timeliness is solely governed by the criteria set forth in Section 6.2.

6.4 Information on Proposal Status

Evaluation of proposals and award of contracts will be expedited, but no information on proposal status will be available until the final selection is made. However, contracting officers may contact any and all qualified proposers prior to contract award.

6.5 Debriefing of Unsuccessful Offerors

Upon written request and after final award decisions have been announced, a debriefing will be provided to unsuccessful offerors for their proposals.

6.6 Correspondence Relating to Proposals

All correspondence relating to proposals should cite the STTR solicitation number and specific topic number and should be addressed to the DoD Component whose address is associated with the specific topic number.

7.0 SCIENTIFIC AND TECHNICAL INFORMATION ASSISTANCE

7.1 DoD Technical Information Services Available

The Defense Technical Information Center (DTIC), the central source of scientific and technical information resulting from and describing research and development projects funded by DoD, is a major component of the DoD Scientific and Technical Information Program. DTIC provides access to and transfer of scientific and technical information for DoD personnel, DoD contractors, and other U.S. Government agencies and their contractors.

The majority of participants in the STTR program, as current Federal contractors, potential defense contractors, or in partnership with institutions eligible to receive DTIC services, will have direct access to DTIC as full-service users. Small firms participating in STTR not falling into these categories are eligible for limited-service DTIC registration.

The scientific and technical information assistance provided by DTIC enables organizations preparing R&D proposals to DoD to make better-informed bid decisions as well as technically stronger submittals. Respondents to this solicitation are encouraged to ascertain their organization's authorization to use DTIC and, if eligible, to request bibliographies of technical reports from DoD-funded R&D in their proposal topic areas as well as the technical reports cited in the bibliographies. Eligible users should also request topic-related work in progress reports.

Call, or visit (by pre-arrangement), DTIC at the location most convenient to you:

Defense Technical Information Center
ATTN: DTIC-User Services
8725 John J Kingman Rd STE 0944
Ft Belvoir VA 22060-6218
(800) 363-7247
(703) 767-8228 (FAX)

DTIC Boston Regional Office
Building 1103, 5 Wright Street
Hanscom AFB
Bedford, MA 01731-5000
(617) 377-2413

DTIC Dayton Regional Office
2690 C Street, Suite 4
Wright Patterson AFB, OH 45433-7411
(513) 255-7905

DTIC Los Angeles Regional Office
222 N. Sepulveda Blvd., Suite 906
El Segundo, CA 90245-4320
(310) 335-4170

DTIC Albuquerque Regional Office
PL/SUL
3550 Aberdeen Ave, SE
Kirtland AFB, NM 87117-6008
(505) 846-6797

For information services in the areas of manpower, personnel, training and simulation devices, human factors and safety, contact the DTIC Manpower and Training Research Information System:

DTIC MATRIS Office
San Diego, CA 92152-6800
(619) 553-7008

DTIC also provides access to DoD-sponsored Centers for Analysis of Scientific and Technical Information (IACs), offering DTIC users specialized reference services and subject matter expertise. IACs are concerned with the Scientific and Technical Information content of worldwide engineering, technical and scientific databases. They receive technical management and direction from the DoD organizations with leading competence in the science and technology area within which each IAC functions. DTIC-managed IACs are as follow:

Chemical Propulsion Information Agency, CPIA
Data and Analysis Center for Software, DACS
Guidance and Control IAC, GACIAC
Infrared Information Analysis Center, IRIA
Metals Information Analysis Center, MIAC
Ceramics Information Analysis Center, CIAC
Metal Matrix Composites IAC, MMCIAC
Nondestructive Testing IAC, NTIAC
Reliability Analysis Center, RAC
High Temperature Materials IAC, HTMIAC
Manufacturing Technology IAC, MTIAC
Survivability/Vulnerability IAC, SURVIAC
Chemical Warfare/Chemical Biological Defense IAC, CBIAC
Crew System Ergonomics IAC, CSERIAC
Tactical Warfare Simulation & Technology IAC, TWSTIAC

For more information about the DTIC IAC program and other DoD IACs contact:

Defense Technical Information Center
DTIC-IAC Program Manager
8725 John J Kingman Rd STE 0944
Ft Belvoir VA 22060-6218
(703)767-9120

7.2 STTR Interactive Topic Information System (SITIS)

Small businesses may ask technical questions about the solicitation topics in Section 8 by using the DTIC/MATRIS STTR/SBIR Interactive Topic Information System (SITIS), an anonymous electronic forum between participant small businesses and the DoD scientists and engineers assigned to STTR topics. SITIS should not be used to ask general questions about the program or solicitation, which instead should be directed to (800) 382-4634.

SITIS is accessible through the World Wide Web at: **http://dticam.dtic.dla.mil/www/sbir/sbir.html** (you can link to SITIS using Mosaic, Netscape, etc.). Technical questions about solicitation topics can also be submitted via e-mail, fax, paper mail, or telephone by contacting the SBIR/STTR Coordinator at:

Defense Technical Information Center
MATRIS Office, DTIC-AM
ATTN: SBIR/STTR Coordinator
53355 Cole Rd.
San Diego, CA 92152-7213
Phone: (619) 553-7000
Fax: (619) 553-7053
Email: sbir@dticam.dtic.dla.mil
WWW: http://dticam.dtic.dla.mil/www/sbir/sbir.html

SITIS electronically posts all questions and answers by topic number, for general viewing, throughout the pre-solicitation and solicitation period. Answers are generally posted within seven working days of question submission. (Answers will also be emailed or faxed directly to the inquirer if the inquirer provides an email address or fax number.) Questions will be accepted until 30 days before the solicitation closing date.

In addition to managing SITIS, the MATRIS Office also provides information services in the areas of manpower, personnel, training and simulation, human factors, and safety.

7.3 DoD Counseling Assistance Available

Small business firms interested in participating in the STTR Program may seek general administrative guidance from small and disadvantaged business utilization specialists located in various Defense Contract Management activities throughout the continental United States. These specialists are available to discuss general administrative requirements to facilitate the submission of proposals and ease the entry of the small high technology business into the Department of Defense marketplace. The small and disadvantaged business utilization specialists are expressly prohibited from taking any action which would give an offeror an unfair advantage over others, such as discussing or explaining the technical requirements of the solicitation, writing or discussing technical or cost proposals, estimating cost or any other actions which are the offerors responsibility as outlined in this solicitation. (See Reference C at the end of this solicitation for a complete listing, with telephone numbers, of Small and Disadvantaged Business Utilization Specialists assigned to these activities.)

7.4 State Assistance Available

Many states have established programs to provide services to those small firms and individuals wishing to participate in the Federal STTR Program. These services vary from state to state, but may include:

- Information and technical assistance;
- Matching funds to STTR recipients;
- Assistance in obtaining Phase III funding.

Contact your State Government Office of Economic Development for further information.

8.0 TECHNICAL TOPICS

Section 8 contains detailed topic descriptions outlining the technical problems for which DoD Components requests proposals for innovative R&D solutions from small businesses. Topics for each participating DoD Component are listed and numbered separately. Each DoD Component Topic Section contains topic descriptions, addresses of organizations to which proposals are to be submitted, and special instructions for preparing and submitting proposals to organizations within the component. Read and follow these instructions carefully to help avoid administrative rejection of your proposal.

ARMY

Submission of Proposals

The responsibility for the implementation, administration, and management of the U.S. Army STTR Program rests with the Army STTR Program Management Office at the U.S. Army Research Office (ARO). You are invited to send your STTR proposals to ARO at the following address. Proposal must be received no later than the Solicitation Closing Date indicated on the front cover of this solicitation.

U.S. Army Research Office
ATTN: STTR-96
P.O. Box. Box 12211
Research Triangle Park, NC 27709-2211

The Army has identified eleven technical topics, numbered ARMY 96T001 through ARMY 96T011, to which small businesses and their partner research institutes may respond. Please note that these are the only topics for which proposals will be accepted at this time. Unless otherwise stated in the topic Phase I will show the concept feasibility and the merit and Phase II will produce a prototype or at least show a proof-of-principle.

The eleven Army STTR topics presented on the following pages were generated by the U.S. Army Research Office. Selection of Phase I proposals for funding is based upon technical merit and the evaluation criteria contained in this solicitation document. Due to limited funding, the Army will only fund those proposals which are of superior technical quality and which present excellent opportunities for dual use and commercialization beyond STTR-funded projects.

Please note that the Army will be limiting Phase I awards to $100,000. Any Phase II contracts resulting from these Phase I efforts will be limited to $500,000.

Department of the Army
FY1996 STTR Topic Descriptions

ARMY 96T001 TITLE: Sensor Protection from Lasers

DESCRIPTION: Protection devices are sought that can prevent damage to human eyes, IR sensors, etc. from laser irradiation, while permitting normal eye and sensor functions. Protection devices must let through much of the visible and/or infrared radiation when no laser irradiation is present, but when irradiated would ideally block all radiation at the laser frequency. Response threshold and response time must be adequate to ensure protection. Typically, sensor protection devices are composed of a protection element embedded in an optical train. For the protection element, possible approaches might use optical and nonlinear optical solutions to the problem, including the nonlinear responses of a variety of newly structured materials that include photonic bandgap structures, photorefractives, and enhanced $X^{(3)}$ nonlinearities of the combined system. The materials may be solid state, gaseous, liquid crystal, or other as appropriate.

PHASE I: Demonstrate proof-of-principle.

PHASE II: Implement a prototype sufficient to identify and resolve any key problems that could otherwise prevent successful commercialization.

COMMERCIALIZATION POTENTIAL: Commercial applications could include coatings on car windows to attenuate incoming headlights, and coatings on windows of buildings to reduce heating from the sun.

ARMY 96T002 TITLE: Energy Absorbing Structures

DESCRIPTION: Innovative methods are needed for energy absorption, via novel structures and/or materials.. Fail safe and/or fail soft approaches might be considered. A primary metric in typical applications would be the rate of energy absorption per unit volume.

PHASE I: Demonstrate proof-of-principle.

PHASE II: Develop a prototype sufficient to identify and resolve any key problems that might otherwise impede successful commercialization.

COMMERCIALIZATION POTENTIAL: Although military applications are obviously to armor, gun recoil, crashworthiness, and ammunition safety, there are also numerous civilian applications including but not limited to transportation safety, fixed assets survival in natural calamities, and manufacturing processes

ARMY 96T003 TITLE: Virtual Training Technologies

DESCRIPTION: Interactive distance learning technologies have matured steadily for use in training diverse skills at dispersed or remote locations, and they have tremendous potential for use in refreshing a previously learned skill or knowledge. New distance learning technologies, most notably internet-based training or interactive satellite, wireless, or cable television, can be used to create "virtual classrooms" to prepare soldiers or civilians across a broad spectrum of knowledge and skills. Intelligent agents could be devised to access the wealth of information available on the internet, and process it into compact instructional materials and intelligent tutoring systems distributed across networks. A further contribution would be to demonstrate the feasibility and value of virtual testing, where "hands-on" testing can occur over the virtual environment, or soldiers could actually be certified in certain tasks, such as installing a mine. The virtual classrooms can also be designed to offer realistic and powerful training simulations in the context of the theater of operation (desert, rugged terrain, cultural climate, etc.) or civilian applications like mountain climbing and driver education. Commercially viable implementations of novel, research-driven training systems for civilian applications of distance learning technologies are the goal of this topic.

PHASE I: Identify requirements for a generic, off-the-shelf hardware system which could combine

distributed technologies with intelligent agents for search and retrieval and intelligent technologies for training. Develop system functional specifications for a prototype system.

PHASE II: Develop the prototype sufficiently as to identify and successfully address any key problems that would otherwise impede successful commercialization.

COMMERCIALIZATION POTENTIAL: Commercial applications would include the teaching of skills to large numbers of people. Examples might be factory workers or truck drivers.

ARMY 96T004 TITLE: Computer Aided Diagnosis and Treatment Display

DESCRIPTION: Innovations are sought in computer aided medical diagnosis and display, suitable for field use. It is envisioned that the device would make intelligent diagnoses and treatment recommendations using real-time inputs about the patient's condition, and a suitable data base of medical information. Recommendations would account for the possibility of multiple life-threatening conditions. Ideally, some of the patient inputs would be generated by non-invasive sensors that continuously monitor the patient's condition.

PHASE I: Proof-of-principle will be demonstrated. Inputs for the demonstration effort may be either standard physiological sensor output or computer-generated inputs.

PHASE II: Hardware and software will be produced as needed to serve as a prototype for commercialization.

COMMERCIALIZATION POTENTIAL: Civilian applications might be to ambulance rescue squads, for use by paramedics.

ARMY 96T005 TITLE: Instrumentation for Coastal Engineering Measurements

DESCRIPTION: Scientists and engineers involved in coastal engineering have requirements to measure waves, water levels, and currents, both in the natural environment and laboratory settings. Advances in electronics, global positioning systems, acoustics, and micro computing open a realm of innovative opportunities to produce useful instrumentation. Examples of potential instruments include, but are not limited to:

(1) GPS Wave Buoy — a wave measuring device for field applications based on a carrier-phase GPS approach without a shore-reference station.

(2) Compact, Portable Hyper Spectral Images and Processing System — for stand alone use or use with a co-located remote sensor such as a lidar bathymetric system. Should include small size, increased horizontal positioning accuracy and increased spatial and spectra resolution compared to existing systems. Processes should offer significant improvements in processor time.

(3) Laboratory systems for measuring: (a) 3 dimensional wave field; (b) current profiles; (c) motions of moored ships. Water depths in laboratory typically less than 1.5 feet and scales 1:10 and 1:50.

(4) High resolution remote monitoring equipment for defining armor unit quality and breakage on coastal structures in the field.

(5) Remote sensing methods for wave and current measurements in areas with heavy traffic.

PHASE I: Proof-of-principle will be demonstrated.

PHASE II: A prototype will be developed to identify and resolve any key problems that might otherwise impede successful commercialization.

COMMERCIALIZATION POTENTIAL: Commercialization potential will obviously depend upon the type of instrumentation developed. It is intended that the instrumentation be developed primarily for the civilian market, even though military applications would exist related to coastal engineering.

ARMY 96T006 TITLE: Information Fusion

DESCRIPTION: Techniques are sought for integrating information from multiple electronic, optic, or similar sources that may have similar or dissimilar characteristics, in order to extract the maximum of available information that may be present in these combined sources. Typical functional applications would be to improve decision making processes under uncertainty, to resolve ambiguities in the recognition and identification of patterns, and to plan for logistics and maintenance. Sound algorithmic designs and robust, efficient computational tools are essential for acquisition, compression, transmission, interpretation of data for near real-time information processing and decision making. Multi-resolution techniques (such as wavelets, quadtrees, etc.) and novel computing paradigms (such as parallel and distributed processing) offer new avenues toward promising advancement in this area.

PHASE I: Develop a detailed design for a proof-of-concept.

PHASE II: Implement the design developed in Phase I and produce a working prototype. Demonstrate the prototype on an appropriate dataset which has the potential for dual-use or commercial exploitation.

COMMERCIALIZATION POTENTIAL: Autonomous image processing and dynamic sensory information fusion is not only necessary for Army's missions in target acquisition and situation awareness, but also important to many civilian applications from manufacturing assembly lines, security verification, medical imaging, and collision avoidance systems for vehicles.

ARMY 96T007 TITLE: Low Energy/Low Noise Electronic Components for Mobile Platform Applications

DESCRIPTION: Techniques are sought for designing and implementing low energy/low noise electronic components suitable for such applications as mobile communications, surveillance, detection, diagnostic, direction and location finding, and imaging. Novel technologies might address signal processing, modulation techniques, amplifier and oscillator circuits, quasi-optical power combining, electro-optic RF control, micromachining techniques, frequency standards, night vision, and ultra-low noise device design.

PHASE I: Develop a proof-of-principle.

PHASE II: Develop a prototype sufficient to identify and resolve any key problems that might otherwise impede successful commercialization.

COMMERCIALIZATION POTENTIAL: Commercial applications are numerous, and include major improvements to portable telephone systems, surveillance, and navigation, to take only the most obvious examples.

ARMY 96T008 TITLE: Antennas for Communications-on-the-Move Networks

DESCRIPTION: Improved ("smart") antennas are needed for portable and mobile communications networks that will reduce needed power, increase throughput, improve reliability, and provide for improved security. It is anticipated that such antennas will operate in currently unused higher frequencies where mobile communications can have wider bandwidths.

PHASE I: Develop proof-of-concept.

PHASE II: Develop a prototype sufficient to identify and resolve any key problems that might otherwise impede successful commercialization.

ARMY 96T009 TITLE: Molecular Recognition

DESCRIPTION: Molecular recognition is a fundamental process that regulates key biological events including enzymatic catalysis, gene expression, macromolecular interactions, and signal transduction. It is also central to the response and adaptation of organisms to the environment and to external stimuli such as stress. Molecular

recognition is characterized both by remarkable specificity and sensitivity, as well as fast reaction rates. To take advantage of the physical principles and properties of molecular recognition, technological advancements are needed to improve enzymatic function, establish the structural basis for receptor-ligand interactions, develop chemical and biological detection devices, and clarify the relationship between structure and function of macromolecules. Areas of interest include, but are not limited to: (1) detection of chemical and biological agents; (2) biomimetic engineering; (3) optimization of enzymatic processes, and: (4) connection of protein structure to function, as these relate to molecular recognition.

PHASE I: Identify and characterize 1) an enzyme or biochemical pathway suitable for use in bioremediation, 2) receptors or receptor-ligand pairs with the potential to act as sensors for chemical or biological agents, or 3) highly ordered biological materials or matrices, especially those capable of sensing changes in environmental or external stimuli.

PHASE II: Optimize molecules or processes identified in Phase I for use in 1) bioremediation, 2) biological detection, or 3) development of new (possibly functional or "smart") materials. It is assumed that this optimization will represent technological and/or economic improvements over current strategies, altogether novel approaches, or previously uncharacterized biological architectures.

COMMERCIALIZATION POTENTIAL: Possible commercial applications include: testing water, soil, plants, and/or animals for chemical or biological contamination; economically and environmentally sound alternatives to removal of toxic contaminants from civilian and military sites; development of new crystalline or other ordered materials; development of new strategies for crystal or material formation; identification of materials with useful properties; development of new strategies for material assembly.

ARMY 96T010 TITLE: Improved Power Sources

DESCRIPTION: The DoD needs quiet, efficient, lightweight power sources that have greater energy/power densities than are currently available. This solicitation invites creative ideas for improving power sources in the power range of a few watts to a few kilowatts.

PHASE I: Develop proof-of-concept.

PHASE II: Develop a prototype sufficient to identify and resolve any key problems that might otherwise impede successful commercialization.

COMMERCIALIZATION POTENTIAL: Commercial applications are dependent on the power range, but could include power sources for communications devices and for computers, at the low end, to power sources to drive motors at the upper end.

ARMY 96T011 TITLE: Electrochemical Synthesis

DESCRIPTION: DoD uses many materials, ranging from metals such as aluminum and titanium to liquid gun propellants, which rely on electrochemical processing for at least some steps in their production. This solicitation calls for creative ideas to improve electrochemical processing of materials.

PHASE I: Develop proof-of-concept.

PHASE II: Develop a prototype sufficient to identify and resolve any key problems that might otherwise impede successful commercialization.

COMMERCIALIZATION POTENTIAL: Commercial applications are to a variety of manufacturing processes that include electrochemical processing as an intrinsic step.

NAVY

Proposal Submission

The responsibility for the implementation, administration and management of the Navy STTR program is with the Office of Naval Research. The Navy STTR Program Manager is Mr. Vincent D. Schaper. Inquiries of a general nature may be brought to the Navy STTR Program Manager's attention and should be addressed to:

Office of Naval Research
ATTN: Mr. Vincent D. Schaper
ONR 362 SBIR
800 North Quincy Street
Arlington, VA 22217-5660
(703) 696-4286

All STTR proposals submitted in response to a Navy STTR topic should be sent to the above address.

This solicitation contains eight technical topics that meet the mission requirements of the Navy and PL 102-564 to which small R&D businesses together with a research institution may respond. The Navy will provide potential awardees the opportunity to reduce the gap between phases I & II by providing a $70,000 Phase I proposal award and a $30,000 Phase I Option award. Only an awardee whose Phase II proposal has been recommended and selected for award will have the Phase I Option funded. Therefore, those who have finished or almost finished their Phase I should submit their Phase II proposal. The Phase II proposal should contain three elements: 1)a plan of how the proposer will commercialize the technology to the government and the private sector; 2) a Phase II work plan; and 3) a Phase II Option. At the end of the Phase II portion, a determination will be made by the Navy as to whether the proposer has satisfied the commercialization plan sufficiently for the government to fund the "Phase II Option" portion of the proposal. The Phase II Option should address the further R&D or test and evaluation aspects of the proposal. The total Phase II funding should not exceed $500,000 with 80% going to the Phase II and 20% for the "option Phase II". Just as the Navy has set aside funding for "fast track" efforts in the SBIR Program, we will consider faster contract award for companies that identify third party funding and can obtain the cash in hand prior to award.

Selection of Phase I proposals is based upon technical merit and evaluation criteria contained in this solicitation document. Due to limited funding, the Navy reserves the right to limit awards under any topic and only those proposals considered to be of superior quality will be funded.

NAVY FY 1996 STTR TOPICS

N96T001 Adaptive Sensor-Driven Control for Dexterous Manipulators

N96T002 Novel Robotic Actuators

N96T003 Haptic Sensing and Display for Telerobotic Manipulation and Virtual Environment Applications

N96T004 Biomimetic Locomotion

N96T005 Non-Toxic Biofouling Control Technologies

DEPARTMENT OF THE NAVY
FY 1996 STTR TOPIC DESCRIPTION

The Navy is seeking innovative, biologically inspired robotic technologies and is planning multiple Phase I awards in each of the following four areas. Topics N96T001 - N96T004 have the same objective, Phase I, Phase II, Phase III, and commercial potential descriptions.

OBJECTIVE: Exploit and implement recent developments in biologically inspired robotic science and technology to advance the Navy's capability for replacing humans with robots in hostile and dangerous environments.

N96T001 TITLE: Adaptive Sensor-Driven Control for Dexterous Manipulators

The focus of this topic is the development and implementation of biologically inspired control algorithms for semi-autonomous robotic grasping and manipulation in unstructured or partially structured environments where reliance on sensory information, adaptation, and learning are essential. The use of haptic (tactile and kinesthetic) information in object recognition and manipulation are of particular interest, but projects on visually guided control will also be considered.

N96T002 TITLE: Novel Robotic Actuators

This topic area concerns the development and implementation of robotic actuators that are muscle-like in their compactness, flexibility, large strength-to-weight ratio, and low level intelligence enabled by distributed, embedded sensors and biologically inspired control schemes.

N96T003 TITLE: Haptic Sensing and Display for Telerobotic Manipulation and Virtual Environment Applications

Topics of interest include haptic sensors, including MEMS (Micro-Electro-Mechanical Systems) based technologies, haptic interfaces, algorithms for encoding the feel and movement of objects, and advances in our understanding of the nature of feedback needed to create a realistic haptic experience.

N96T004 TITLE: Biomimetic Locomotion

Biomechanics, hydrodynamics, and control of locomotion in non-legged aquatic animals such as fish and marine mammals are of interest. Of most interest are mechanisms underlying highly maneuverable forms of locomotion, and technology for implementing biologically inspired design concepts for highly maneuverable underwater vehicles. Mechanisms underlying stealth and efficient locomotion are also of interest.

PHASE I: Demonstrate feasibility of concept or technology; identify critical issues for implementation and transition into Navy-relevant technology; identify performance goals and the work necessary in a Phase II effort.

PHASE II: Implement technology in prototype hardware and/or software products. Demonstrate the prototype for application to a Navy relevant problem.

PHASE III: Develop for commercialization the prototypes resulting from Phase II effort. The ability for commercial transition in the Phase III effort to will be critical for both Phase I and Phase II selection.

COMMERCIAL POTENTIAL: Robotic control algorithms, sensors, actuators, and haptic interfaces have commercial potential in a wide variety of domains, including hazardous waste removal, nuclear plant maintenance, tele-surgery, oceanographic exploration, and underwater pipeline maintenance. Haptic interfaces have commercial potential for virtual reality applications in the entertainment industry, medical training, aerospace industry training,

and computer interfaces. Techniques for increasing the efficiency and maneuverability of underwater vehicles have commercial potential for remote underwater exploration and pipeline maintenance.

N96T005 TITLE: Non-Toxic Biofouling Control Technologies

OBJECTIVE: The objective of this topic is to provide non-toxic antifouling (AF) agents and delivery/control release systems for the AF agents suitable for hull coatings and other applications

DESCRIPTION: Current technologies for biofouling control on ship hulls, underwater structures, storage tanks, water treatment facilities and in the power industries involve toxic metals (copper, tin and zinc) incorporated into coating materials or used as water additives. More recently, toxic organic compounds have been introduced to control fouling in closed systems and in coatings. These materials or systems do not provide sufficiently long-term AF capabilities, they have come under increasing environmental restrictions, have serious and costly disposal problems, and, in many cases, pose significant human health hazards in their application, maintenance or removal. This program seeks (1) non-toxic and/or environmentally benign AF agents derived from biological or biomimetic sources that can be incorporated in coatings or used as water additives and (2) delivery systems and/or controlled release technologies that can maintain biofouling control on coatings and environmental efficacy. About 5 awards will be made in this topic area which address one or more of the areas below:

1. Demonstration of novel, non toxic AF agents and their environmentally efficacy.
2. Demonstrate controlled release technologies for small organic AF agents suitable for a range of coating materials.
3. Demonstration of delivery technologies for small organic AF agents based on coating polymer chemistry (pendant arm hydrolysis, ablation, etc.)

PHASE I: Develop and establish proof-of-concept of non-toxic AF agents which are effective against some or all classes of biofouling organisms at millimolar or less levels with demonstrated environmental efficacy. Develop and establish proof-of-concept of controlled release technologies that are capable of delivering small organic AF agents at rates less than 10 ug cm-2 day and achieve biofouling control, and which can be incorporated into current and newly emerging coating materials. Develop a Phase II plan which can demonstrate technical feasibility and transition to commercialization as an affordable technology.

PHASE II: Demonstrate technology in Phase I as to biofouling control efficiency, environmental efficacy and potential for commercialization.

PHASE III: Implement technologies into existing or new coatings materials and demonstrate AF and environmental efficacy under field or operational conditions.

COMMERCIAL POTENTIAL: There are several large commercial applications for these technologies. They include antifouling marine coatings for hulls, non-fouling coatings for off shore structures in the power and oil industries, coatings for storage systems, water treatment facilities, electric power generating plants and cooling towers, and for submerged platforms. In addition these materials and systems will have commercial markets in the hard surface cleaning industries, water treatment industries, other paint and coating systems, public health related industries (air/water handling systems for buildings, aircraft and ships), and in the biomedical industries (protheses, dental instrumentation, etc.).

REFERENCES:

1. Alberte, R.S., et al., (eds.) 1992. Aspects of Current Research in the US Navy Biofouling Program. Biofouling 6:(2): 91-218.
2. Wicks, Z.W., Jones, F.N. and Pappas, S.P. 1992. Organic Coatings: Science and Technology, Vols. I and 2. John-Wiley & Sons, Inc.
3. Alberte, R.S. and Snyder, S. (eds). 1995. Biofouling Control. Naval Research Reviews (in press).

AIR FORCE

PROPOSAL PREPARATION INSTRUCTIONS

The responsibility for the implementation and management of the Air Force STTR Program is with the Air Force Materiel Command, Wright-Patterson Air Force Base, Ohio. The Air Force STTR Program Executive is R. Jill Dickman, (800) 222-0336. Do NOT submit STTR proposals to the AF STTR Program Executive under any circumstances. Addresses for proposal submission and numbers for administrative and contracting questions are listed on the following page.

Technical questions may be requested using the DTIC SBIR Interactive Technical Information System (SITIS). For a full description of this system and other technical information assistance available from DTIC, please refer to section 7.2 of this solicitation.

Pre-Solicitation Announcements (PSA), listing the full descriptions of the topics and the author of each were issued by the individual AF laboratories in electronic and hard copies, after being announced in the Commerce Business Daily. Contact the laboratories directly for information on their PSAs (see activity/mailing addresses and phone numbers on the next page). Open discussions were held with the topic authors concerning technical aspects of the topics until this solicitation was released. Small businesses that did not know about the PSAs or did not participate in the exchange may find relevant questions or comments from these talks listed in SITIS.

For each Phase I proposal, send one original and three (3) copies to the office designated on the following page. Be advised that any overnight delivery may not reach the appropriate desk within one day.

Unless otherwise stated in the topic, Phase I will show the concept feasibility and the merit and Phase II will produce a prototype or at least show a proof-of-principle.

AIR FORCE PROPOSAL SUBMISSION INSTRUCTIONS

TOPIC NUMBER	ACTIVITY/MAILING ADDRESS (Name and number for mailing proposals and for administrative questions)	CONTRACTING AUTHORITY (For contract questions only)
AF 96T001	Air Force Office of Scientific Research AFOSR/XPP (Dr. Jerome Franck) 110 Duncan Avenue, Suite B115 Bolling AFB DC 20332-0001 (Dr. Jerome Franck, (202) 767-4970)	Ernest Zinser (202) 767-4992
AF 96T002 - AF 96T003	Armstrong Laboratory AL/XPTT 2509 Kennedy Circle Brooks AFB, TX 78235-5118 (Belva Williams, (210) 536-2103)	Sharon Shen (210) 536-6393
AF 96T004	Rome Laboratory RL/XPX 26 Electronic Parkway Griffiss AFB, NY 13441-4514 (Margot Ashcroft, (315) 330-3046)	Joetta Bernhard (315) 330-2308
AF 96T005 - AF96T006	Phillips Laboratory/XPI SBIR Program (R. Hancock) 3650 Aberdeen Ave SE Kirtland AFB, NM 87117-5776 (Robert Hancock, (505) 846-4418)	Mr. Francisco Tapia (505) 846-5021
AF 96T007	Armament Directorate WL/MNPX 101 West Eglin Blvd, Suite 143 Eglin AFB, FL 32542-6810 (Jerry Jones, (904) 882-8591)	Lyle Crews, Jr (904) 882-4284
AF 96T008	WL/AAOP, BLDG 624 2nd Floor ATTN: Sharon Gibbons 2011 8th Street, Room N2G21 Wright-Patterson AFB, OH 45433-7623 (Sharon Gibbons, (513) 255-5285)	Terry Rogers (513) 255-5830 Bruce Miller (513) 255-7143
AF 96T009	WL/MLIP, BLDG 653 2977 P St, Ste 13 Wright-Patterson AFB, OH 45433-6523 (Sharon Starr, (513) 255-7175)	Terry Rogers (513) 255-5830 Bruce Miller (513) 255-7143

AIR FORCE TOPIC DESCRIPTIONS

AF 96T001 Title: Fabrication and Characterization of Oxide-Fiber based Ceramic Matrix Composites

DESCRIPTION: Oxide fiber-based ceramic matrix composites exhibit a number of attractive features for applications as high-temperature engine materials. Because these materials are composed of oxides, they are inherently stable at very high temperatures and in oxidizing environments. However, two problems are currently hindering the introduction of oxide CMCs in Air Force and industrial applications: (1) lack of understanding of the relationship between microstructure and high-temperature properties of fibers, and (2) high cost of oxide fibers. This announcement seeks to alleviate both of these problems. It concentrates on novel, economical technologies for fabricating high quality oxide fibers and coatings compatible with the fibers at very high temperatures. Phase I should demonstrate a reliable, economical approach to fabricating large quantities of high quality oxide ceramic fibers (YAG, alumina, mullite) capable of operating at temperatures near or above 1500 C for extended periods of time. Phase II will concentrate on fabricating and testing composites from the oxide fibers. This will entail development and application of fiber coatings capable of protecting these fibers at temperatures up to 1500 C, developing economical and compatible oxide matrixes, and mechanical testing at room and elevated temperatures of the produced composites. The advances in these technologies should lead to fabrication of CMCs capable of operating at very high temperatures with vital Air Force and dual-use applications.

AF 96T002 TITLE: Development of Analytical Methods for the Detection of AFFF

DESCRIPTION: Develop new and innovative methods to detect and measure Aqueous Film Forming Foam (AFFF) contamination in soils, groundwater, and wastewater. The high Biological Oxygen Demand (BOD) and foaming tendencies of military grade AFFF-contaminated wastewater cause problems with treatment in wastewater treatment facilities. New technologies are being developed to circumvent this problem by physical or chemical remediation. However, as no method exists to determine the level of the compounds, the efficacy and efficiency of these systems cannot be thoroughly tested. As of now, only indirect American Society for Testing and Materials (ASTM) analytical methods exist for the analysis of contaminants and co-contaminants of AFFF-laden water: BOD, Total Organic Carbon (TOC), Benzene Toluene Ethyl Xylene (BTEX), Chemical Oxygen Demand (COD) and simple foaming tests. However, these methods do not accurately represent the concentration of the waste components. In addition to AFFF-laden wastewater, AFFF and its associated compounds present problems when introduced to the subsurface (e.g. contamination of soil and groundwater). Since there is no federally (EPA) authorized analytical protocol for AFFF waste analysis, or for determination of the fate and transport of those components in the atmosphere, or to measure the effects of AFFF components on other associated contaminants, a method to identify, quantify, and measure the fate and transport of those compounds in a given medium must be developed. The formulation of military grade AFFF is a complex proprietary mixture whose perfluorinated surfactant portions may be composed of any combination of various fluorocarbon surfactants. This complex mixture and the foaming tendency of AFFF makes chemical analysis of AFFF and its co-contaminants extremely tedious, if not nearly impossible, by current standard methods. The Air Force requires information on how to detect and measure AFFF components (specifically the fluorocarbon surfactants) and co-contaminants in soils, groundwater, and wastewater. The solvent (which is used as a foam stabilizer) in AFFF, 2(2-butoxyethoxyethanol), is easily measured. However, its presence complicates other analyses. The goals of the Phase I and Phase II proposed research are to: (1) characterize all surfactant and additive components of AFFF including corrosion inhibitors, foam stabilizers, detergents, and fluorocarbon surfactants; (2) identify and quantify the possible biological and chemical breakdown products of these compounds (including the solvent) following oxidative degradation; and (3) develop methods of extraction from soils and groundwater to provide samples to be accurately and precisely tested by the method developed in Goal one. The research must establish the presence of the AFFF components in the presence of other environmental contaminants such as petroleum hydrocarbons, chlorinated solvents and dense nonaqueous phase liquids (DNAPLs) (e.g. chlorinated solvents). The research must also address the foaming problem presented by AFFF. The ultimate goal is to be able to use the technique(s) established under this program to measure the components that are of importance to AFFF remediation processes and to make the technique field applicable. Research in Phase I would answer the questions listed above. This knowledge is necessary to develop methods used to identify and quantify AFFF and its components and co-contaminants to: (1) resolve the levels of the compounds in wastewaters, (2) determine their fate and transport in the environment, and (3) understand their persistence in the subsurface. In the Phase II, knowledge gained through this research can be incorporated into a treatment process plan, or verification of such a plan, for fluorocarbon surfactant-contaminated sites and wastewater. Proper interaction with federal, state, and local legal authorities for final approval of the test protocol would also take place in Phase II. Operation should also extend to other applications such as a marketable mobile field kit used to determine the levels of the compounds in a given media. This research would allow

a more direct method of the detection of AFFF and its associated compounds both in wastewater and the subsurface. The development of an innovative cost-effective methodology for the detection of these compounds could be used by both government agencies and the commercial sector. The development of a sensory device or an analytical field kit would aid any organization or agency with the detection of AFFF contamination levels in a given medium. Application will extend to treatment of wastewater, reclamation of AFFF, and the prevention of AFFF interference with soil remediation technologies.

Additional technical information packets may be obtained by calling Belva Williams (210)536-2103.

AF 96T003 TITLE: Site Assessment Software For Total Petroleum Hydrocarbons

DESCRIPTION: The Armstrong Laboratory (AL) is soliciting ideas for the development of a user-friendly software package to assist in making decisions regarding remediation of dump/spill sites contaminated with weathered petroleum hydrocarbons from fuels and lubricants. Petroleum hydrocarbons are one of the most common contaminants found on military bases and commercial/industrial sites. AL is conducting mammalian toxicity tests to provide information on bioavailability and toxicity of selected components of weathered jet fuels. The awardee is expected to collaborate with the AL by conducting research to strengthen the toxicology database, and develop software which incorporates the following site assessment capabilities for weathered total petroleum hydrocarbons (TPH): 1. cost/benefit analysis for cleanup alternatives; 2. tiered approach for risk assessment and establishing clean-up goals (generic to site-specific); and 3. Federal and selected state regulations. The TPH software is intended for use by environmental professionals such as regulators, consultants, and engineers to support health-risk based decision making (risk management) in determination of site remediation goals for TPH analytes in the environment, and for tutorial and educational purposes. The need is self evident; there is a vast number of government and commercial sites that have environmental problems from historic (and current) use of petroleum based fuels, and there are currently no generally accepted risk-based cleanup standards for weathered TPH. The commercial potential for this product is high because no product with the described features is currently available from any source, and demand will be high because of the government's increasing emphasis on risk based management of environmental concerns. Phase I of this project will consist of developing a prototype software package, identifying data gaps, and proposing experimental methodologies to fill the gaps. Phase II will consist of filling data gaps by experimentation and complete development of the TPH software package.

Additional technical information packets may be obtained by calling Belva Williams (210)536-2103.

AF 96T004 TITLE: Innovative C3I Technologies

DESCRIPTION: C3I Technology pursued within Rome Laboratory addresses four mission thrusts: Command, Control, and Communications; Electromagnetics and Reliability; Intelligence and Reconnaissance; and Surveillance and Photonics. Proposals may address any aspect of C3I technology. Proposed titles must reflect the specific technology problem being addressed. Areas of interest may include, but are not limited to, the following:

a) C3 concepts for fixed, mobile, or distributed command centers; mission-support system-planning tools; innovative methods for employing commercial off-the-shelf communications technology; innovative concepts and technologies in computer science (including software engineering, software quality, distributed-computer-systems technology, artificial intelligence, and distributed data bases); innovative concepts in information portrayal; and survivable protocols.

b) Electromagnetic technology, including the following: 1) adaptive pattern control for high-performance phased-array antennas; 2) innovative target and clutter scattering models for improved radar detection; 3) improved modeling of high frequency propagation for enhanced communications and small target detection; 4) monolithic millimeter wave components; 5) mate-rials for thin, lightweight, conformal, phased arrays; 6) superconducting electronics for improved phased arrays, signal detection, and signal processing; and 7) computational electromagnetics for assessing susceptibility in RF environments.

c) Science and engineering research that encompasses all aspects of the system life cycle from "cradle to grave," including development and use of tools and techniques such as the following: 1) modeling and simulation; 2) materials and process characterization; 3) operational assessments; 4) assessments and correction of failure modes and effects; 5) development of diagnostic techniques for implementation of cost-effective, logistic support capability.

d) Intelligence technology, including the following: target identification, signal exploitation, data handling, sensor exploitation, speech processing, mass storage, and information war-fare; to provide real-time information that will dramatically enhance air superiority, survivability and global awareness.

e) A wide variety of surveillance technologies; including signal processing; airborne radars (bistatic radars and multispectral surveillance radars); advanced algorithm development and testing for airborne surveillance systems; and the application of digital and analog photonics to existing and planned Air Force systems.

AF 96T005 TITLE Innovative Applications of Advanced Photonics

DESCRIPTION: The Phillips Laboratory (PL) has corporate responsibility in the Air Force for the development of advanced weapons technologies. This activity includes the development of semiconductor diode lasers, diode-pumped solid-state lasers, mid-infrared lasers, chemical oxygen/iodine lasers, and photolytic iodine lasers. These high power lasers, as well as related advancements in the development of nonlinear optics, nonlinear coupling of lasers, spatial light modulators, and imaging (active, passive and compensated), offer a wide range of opportunities for innovative, dual-use applications. It should be noted that while the PL is not specifically interested in developing fiber-optic network technology, offerors should not be discouraged from submitting proposals which involve the use of fiber-optics or fiber optic couplings. New and innovative concepts for the development of technologies and/or applications in the following fields are sought.

Industrial Applications: PL is seeking novel proposals for innovative applications of high power lasers at wavelengths suitable for materials processing. Such applications may include precision measurement, cutting, boring, drilling, and welding as well as computer aided fabrication and assembly. Proposals to develop similar novel applications using emerging imaging technologies may also be appropriate.

AF 96T006 TITLE: Innovative Applications of Advanced Spacecraft and Launch Vehicle Technologies

DESCRIPTION: The Phillips Laboratory (PL) has corporate responsibility in the Air Force for the development of advanced spacecraft and launch vehicle technologies. This activity includes the development of advanced space structures concepts; design, analysis and test methodologies for spacecraft and launch vehicle structures; vibration isolation; vibration damping; active and passive structural control; stabilization and precision pointing; smart mechanism and device concepts; sensors and actuators; and health monitoring systems. New and innovative concepts for the development of technologies and/or dual-use applications in the following fields are sought.

a. Lightweight Momentum Energy Storage Devices for Space Applications: The Air Force has identified an interest in investigating and developing potential applications of lightweight momentum energy storage devices as an alternative to conventional batteries for energy storage for advanced space applications. The design goals are to develop a system capable of energy storage/retrieval through a motor/generator system that would provide a 25% decrease in system weight as compared to conventional battery systems and increase overall component life to >20 years. The proposed momentum energy storage system must demonstrate the capability to provide equivalent or better long-term energy storage and retrieval to that of conventional battery systems based upon the same available power from a solar array. The PL is seeking innovative concepts for the design, analysis, fabrication and test of a lightweight momentum energy storage device for advanced space applications. The system must also take into account satellite stabilization requirements. The system must be capable of providing attitude control actuation while performing its primary function of energy storage/retrieval. This technology has application to all three axis stabilized military and commercial satellites and may have a profound impact on programs such as IRIDIUM and TELEDESIC.

b. Industrial Applications: PL is seeking novel proposals for innovative applications of vibration isolation, vibration damping, stabilization, precision control, and smart mechanisms/devices applicable to launch vehicle and spacecraft precision pointing missions. In addition, innovative proposals addressing health monitoring of dynamic systems using expert systems or neural network architectures are sought. Proposals to develop industrial applications of these technologies in the areas of precision machining and manufacturing, precision measurement equipment, semi-conductor fabrication, and health monitoring may also be appropriate.

AF 96T007 TITLE: Polymer/Nanocrystal Blends for Flexible Microelectronic Circuits and Devices

OBJECTIVE: Develop techniques for using semiconducting ceramic nanoscale particles in conducting polymers for flexible transistors and entire microelectronic circuits.

DESCRIPTION: Hard target fuzing involves operation of target sensing and detonation microcircuitry that can survive repeated high-G shock resulting from the penetration reinforced concrete barriers which surround the heart of the target. Indeed, hard target fuzing could benefit from increased shock survivability, producibility, and affordability conceivable through all-polymer circuit design. Having no metal attachments or rigid connections, circuit fabrication would simply require use of print rollers to perform a series of printing operations. The conducting polymer materials may be more readily tailored with regard to electronic properties using nanocrystalline ceramic additives, and appropriate interfacial modifiers to achieve either n-type or p-type semiconducting behavior. Optimal "polyramics" developed will be highly processible polymer/ceramic nanocomposite blends exhibiting stable semiconductivity, conductivity, or superconductivity useful for making a wide variety of electronics junction devices and interconnects.

PHASE I: Phase I will attempt to model and verify bulk polyramics nanocomposite electronic behavior and will include experimental validation of at least one type of p-n junction device.

PHASE II: Phase II will be a detailed evaluation of microcircuitry and device applications using the most favorable polyramics materials with regard to processibility.

POTENTIAL COMMERCIAL MARKET: The materials and processes to be developed under this effort offer broad prospects for low-cost, all-polymer flexible circuits suitable for a variety of commercial products ranging from electronics toys to sea-worthy portable radios having no metal parts.

Technical information packets for the topic may be obtained by calling Jerry Jones, (904) 882-8591, ext 1250.

AF 96T008 TITLE: Advanced Optical Beam Steering Technology

DESCRIPTION: The Wright Laboratory Avionics Directorate is soliciting ideas for the development of beam steering technologies that relate to the transmission and reception of laser radiation that go beyond the current state of the art. Current systems rely on optical pointing systems that are very complex, costly, and too large for most aircraft applications. The Avionics Directorate is interested in laser beam steering concepts, techniques, and devices for a broad range of potential future Air Force applications including laser radar, communications, displays, optical mass storage and electronic warfare. The goal is to eventually replace the current large and complex mirrored gimbal systems in use today with small, low cost systems that can be internally or conformally mounted in an aircraft. The technologies may include, but are not limited to, electro-optical devices, acousto-optical devices, micro mirrors, micro lenses, fiber-optics, and liquid crystal devices. Since most of the applications are airborne, the beam steering technologies should be capable of future compact packaging. Future systems must also be light weight and robust to operate in a dynamic flight environment where vibration and temperature factors are critical. Other critical parameters for the above applications include: broad wavelength operation, wide field-of-regard coverage, optical transmit and receive capability, high optical pointing stability, small instantaneous field-of-view, low optical distortion, fast slew rates, and ability to handle high average laser powers.

PHASE I: Determine the technical merit and feasibility of the ideas submitted. Specific experiments should be conducted to verify critical aspects of the defined concepts.

PHASE II: Fabricate a prototype demonstration of the concept defined in Phase I and experimentally demonstrate the concept.

POTENTIAL COMMERCIAL MARKET: Commercial applications exist in the areas of mass optical data storage for computers and fiber optic switching networks.

Technical information packets for the topic may be obtained by calling Sharon Gibbons, (513) 255-5285.

AF 96T009 Title: Metals, Nonmetals, Computational Science, Electronic and Optical Materials and Processes For Aerospace Applications

DESCRIPTION: The Materials Directorate, Wright Laboratory (WL/ML), is soliciting ideas for the development of high payoff aerospace materials and processes in the areas of metals, nonmetals, computational science, electronics and optics, and high energy laser applications.

In the areas of metals, nonmetals, computational science, and high energy laser applications: structural and nonstructural materials and processes are solicited with emphasis on control of structure and properties whether to achieve high temperature, low weight, or specialized properties. New approaches are needed to process these materials in an efficient, affordable, timely, and environmentally safe manner. Example areas are: closed-loop feedback-based process control; computational science and modeling and simulation of processes; low-cost curing of composites; advanced deposition techniques for thin films and bulk materials; in situ real-time in-process monitoring and inspection; high temperature reaction processes, and fatigue processes. In addition, materials and processes for long-life (5-7 years), environmentally compliant survivable aircraft coatings are being sought in addition to novel application techniques that allow little or no volatile organic compounds or hazardous air pollutants. In addition to the metals, and computational science areas, new and innovative ideas are also being sought for laser removal of paint and other coatings from aircraft and related systems (composite and metal surfaces) and ideas and techniques for laser treatment of aircraft metal surfaces to inhibit or reduce fatigue crack growth. Ideas for laser removal of paint and coatings should emphasize clean and efficient stripping, little or no cosmetic damage or structural degradation of undersurfaces, and elimination of hazardous chemical use or production of hazardous byproducts. For laser surface treatment ideas, there is special interest in extending the life/performance of aircraft and engine components that are subject to high cycle fatigue.

In the areas of electronic and optical materials: ideas are solicited for the development of high payoff materials and processes for microelectronics; microwave and millimeter wave applications; infrared (IR) detectors; electro-optics; IR transparencies; and magnetic materials. This includes nonlinear optical materials, semiconductor materials for electronics, and thin film high temperature superconductors. The goal is to develop innovative and creative solutions to problems in the area of electronic and optical material growth that result in practical growth techniques suitable for commercial production. Devices may be examined only for the purpose of evaluating and demonstrating the techniques and materials which have been developed to enable successful device fabrication.

PHASE I: Determine the technical approach and feasibility of the ideas submitted. Specific experiments should be conducted to verify critical aspects of the defined concepts.

PHASE II: Fabricate a prototype demonstration of the material concept defined in Phase I and experimentally demonstrate materials properties and/or processing technique and parameters.

POTENTIAL COMMERCIAL MARKET: In the areas of metals, nonmetals, computational science, and high energy laser applications: Commercial applications exist in the aerospace industry as well as in the automotive industry for affordable, lightweight structures, high temperature engine components, and low-cost materials processing. Applications also exist for environmentally compliant materials and processes. A third application area is maintainable, long-life infrastructure materials technologies. In the ares of electronic and optical materials: Commercial applications exist in millimeter wave and microwave communications, high speed electronics and photonics for data transmittal and computing, and magnetics for high efficient electric motors.

Technical information packets for the topic may be obtained by calling Sharon Starr, (513) 255-7175.

ADVANCED RESEARCH PROJECTS AGENCY
Submission of Proposals

ARPA's charter is to help maintain U.S. technological superiority over, and prevent technological surprise by, its potential adversaries. Thus, the ARPA goal is to pursue as many highly imaginative and innovative research ideas and concepts with potential dual-use applicability as the budget and other factors will allow.

The responsibility for implementing ARPA's Small Business Technology Transfer (STTR) Program rests with the Office of Administration and Small Business (OASB). The ARPA SBIR/STTR Program Manager is Connie Jacobs. ARPA invites small businesses, in cooperation with a researcher from a university, an eligible contractor-operated federally-funded research and development center (FFRDC), or a non-profit research institution, to send proposals directly to ARPA at the following address:

ARPA/OASB/STTR
Attention: Ms. Connie Jacobs
3701 North Fairfax Drive
Arlington, VA 22203-1714
(703) 696-2448

The topics published in this solicitation are broad in scope. They were developed to bring the small business community and research partners together to meet the technological needs of today. ARPA has identified 3 technical topics, numbered **ARPA ST961-001** through **ARPA ST961-003**, to which small businesses may respond in the FY 96 solicitation. For the following topics, Phase I will show the concept of feasibility and the merit, and Phase II will produce a prototype or at least show a proof-of-principle.

ARPA Phase I awards are limited to **$99,000**, and are for approximately one (1) year efforts. Phase II awards will be limited to $500,000. ARPA does not provide bridge funding between Phase I and Phase II awards, except in connection with the fast-track provisions outlined in Section 4.4.

ARPA selects proposals for funding based upon technical merit, its potential for commercialization, and other evaluation criteria contained in this solicitation document. ARPA reserves the right to select and fund only those proposals considered to be superior in overall technical quality and highly relevant to the ARPA mission. As a result, ARPA may fund more than one proposal in a specific topic area if the technical quality of the proposal(s) in question is deemed superior, or it may fund no proposals in a topic area. Each proposal submitted to ARPA must have a topic number and must be responsive to only one topic.

For each Phase I proposal, submit one original (with red appendices A and B) and four (4) copies to the address above. One additional photocopy of Appendices A and B is also requested. ARPA has prepared a checklist to assist small businesses in responding to ARPA topics. Please use this checklist prior to mailing or handcarrying your proposal(s) to ARPA. Do not include the checklist with your proposal.

ARPA 1996 Phase I STTR
Checklist

1) Proposal Format
   a. Cover Sheet - Appendix A (identify topic number) _____
   b. Project Summary - Appendix B _____
   c. Identification and Significance of Problem or Opportunity _____
   d. Phase I Technical Objectives _____
   e. Phase I Work Plan _____
   f. Related Work _____
   g. Relationship with Future Research and/or Development _____
   h. Potential Post Applications _____
   i. Key Personnel _____
   j. Facilities/Equipment _____
   k. Consultant _____
   l. Prior, Current, or Pending Support _____
   m. Cost Proposal (see Appendix C of this Solicitation) _____
   n. Prior SBIR Awards _____
   o. Agreement between the Small Business and Research Institution _____

2) Bindings
   a. Staple proposals in upper left-hand corner. _____
   b. **Do not** use a cover. _____
   c. **Do not** use special bindings. _____

3) Page Limitation
   a. Total for each proposal is 25 pages inclusive of cost proposal and resumes. _____
   b. Beyond the 25 page limit do not send appendices, attachments and/or additional references. _____

4) Submission Requirement for Each Proposal
   a. Original proposal, including signed **RED** Appendices A and B. _____
   b. Four photocopies of original proposal, including signed Appendices A and B. _____
   c. One additional photocopy of Appendices A and B only. _____

ARPA ST961-001 TITLE: Technologies to Detect and Localize Snipers and Associated Small Arms Gunfire Events

DESCRIPTION: Distributed and single array sensor and associated processing system concepts to detect and localize a sniper's position to an accuracy of less than 3m radians in both azimuth and elevation at ranges in excess of 1000 meters, in adverse and urban environments, are requested. Sensor systems of interest include, but are not limited to, acoustic systems to exploit shock and muzzle blast signatures, electro-optical sensor systems to exploit signatures associated with the sniper's human figure, the hot gun barrel, the muzzle blast event, and RF and electro-optical sensor systems to track the bullet's trajectory.

Technical challenges for this topic include, but are not limited to, acoustic shock and muzzle blast multi-path and clutter rejection in urban environments; vehicle motion compensation and noise cancellation; signal attenuation and selected signature denial, if snipers use advanced tactics and special devices (muzzle blast suppressors or silencers) in high-ambient noise environments.

Small, cost-effective systems that are vehicle mounted, stationary, but man-transportable or man-wearable, are required. Cost, size, weight, power consumption, ergonomics and human computer interface, response time, spatial resolution accuracy, range accuracy, and robustness with regards to countermeasures and advanced sniper tactics, are the primary parameters that will be considered in the evaluation of proposed system concepts.

REFERENCES:

1) Acoustic Projectile Trajectory Evaluation Device, United States Patent Number 5,258,962 (November 2, 1992).
2) Position Measuring Apparatus and Method, United States Patent Number 4,885,725 (dated December 5, 1989).
3) Optical Frequency Encoding for Normal Shock and Position Sensing Having a Broadband Light Source and a Color Gradient Filter, United States Patent Number 5,283,430 (dated February 1, 1994).
4) Projectile Position Detection Apparatus, United States Patent Number 4,350,881 (dated September 21, 1982).

ARPA ST961-002 TITLE: High-Power Vertical Cavity Surface Emitting Lasers (VCSEL) for Commercial and Military Systems

DESCRIPTION: There are a wide range of military systems which require high-power, reliable, and efficient lasers. These include laser radar, laser line of sight communications, optical fuzing, large displays, lightweight countermeasures, and high density storage. However, a suitable electronically steerable cost effective source has not been available for laser communication or laser radar. Recent developments in optoelectronics technology have led to the emergence of a new type of laser called Vertical Cavity Surface Emitting Lasers (VCSELs). VCSELs have been fabricated with efficiencies above 50%, low-lasing thresholds of under 100 micro amps, as well as having high wafer yields of above 90%. These lasers readily lend themselves to the fabrication of large 1-D and 2-D arrays. Coherent arrays would enable a large number of applications to become cost-effective such as laser communication, laser radar, laser scanning, large displays, as well as optical fuzing applications. Military laser communication, especially satellite-to-satellite, air-air, and satellite-air, and secure terrestrial mobile communication would be significantly enhanced by the lightweight, low-power, and very high-data rates enabled by this technology. This program would focus on the development of an electronically steerable (10 degrees) high-power (>1 watt) laser source based on VCSELs for commercial and military applications.

REFERENCES:

1) R.A. Morgan, K. Kojima, L.E. Rogers, G.D. Guth, R.E. Leibenguth, M.W. Focht, M.T. Asom, T. Mullally, and W.A. Gault, "Progress and Properties of High-Power Vertical-Cavity Surface-Emitting Laser Arrays," Laser Diode Technology V, OE/ LASE '93, pp. 100-108, SPIE, Bellingham, WA, 1993.
2) F. H. Peters, et al, "High-Power VCSELs", Electronic Letters, Vol. 29, 200 , January, 1993.

ARPA ST961-003 TITLE: High Dynamic-Range Diode Laser Sources

DESCRIPTION: Photonic links have many applications in current and anticipated radar systems. Compact diode laser sources are desired which can replace linearized external modulation fiber optic links, with the resulting reduction in cost and complexity. A highly linear diode laser source needs to be developed which operates over a wide temperature range without a thermoelectric cooler. The laser should have low relative intensity noise and high linearity to provide a directly modulated UHF optical link with a spurious-free dynamic range of 122dB*Hz2/3 for transmission distances up to 250m. The laser should maintain this performance over a temperature range of -60 deg C to +40 deg C with a predetermined bias condition (e.g. constant drive current or constant output optical power). Link performance should be demonstrated over a minimum bandwidth of 10% in the UHF band.

REFERENCES:

1) LeBihan, J. and G. Yabre, "FM and IM Intermodulation Distortions in Directly Modulated Single-Mode Semiconductor Lasers," IEEE J. Quant. Elect., Vol. 40, No. 4, April 1994.

2) Darcie, E. Thomas, and George E. Bodeep, "Lightwave Subcarrier CATV Transmission Systems," IEEE Trans. Microwave Th. & Tech., Vol. 38, No. 5, May 1990.

3) Ackerman, E., et al, "A Low-Loss Ku-Band Directly Modulated Fiber-Optic Link," IEEE Photonics Tech. Lett., Vol. 3, No. 2, Feb 1991.

4) Lu, H., et al, "Strained-Layer MQW Gain-Coupled DFB Lasers: An Approach for High-Power and High Temperature Operation," OFC '95 Technical Digest, Vol. 8. Opt. Soc. America, 1995.

5) Morthier, G., "Influence of the Carrier Density Dependence of the Absorption on the Harmonic Distortion in Semiconductor Lasers," Journal of Lightwave Technology, Vol. 11, January 1993, p. 16.

6) Camacho, Fernando, et al, "Fundamental Limits for Linearity of CATV Lasers," Paper CThJ1, CLEO '94 Proceedings, Opt. Soc. America, 1994.

BALLISTIC MISSILE DEFENSE ORGANIZATION (BMDO)
SMALL BUSINESS TECHNOLOGY TRANSFER PROGRAM
Submitting Proposals

Send **five** copies of Phase I proposals to:
(Appendix A and B need not be red)

Ballistic Missile Defense Organization
ATTN: TRI/STTR
7100 Defense, Pentagon
Washington, DC 20301-7100

For administrative help **ONLY**: call **800-937-3150**

Electronic access: **800-WIN-BMDO** (bulletin board system) or
http://www.futron.com/bmdo/sbir.html (A Home Page/World-Wide-Web)

Proposals delivered by means other than US Mail must be delivered to Room 1D110, The Pentagon, Washington, DC. **WARNING: Only persons with access to the interior of the Pentagon building can reach Room 1D110. Delivery to a Pentagon entrance is not sufficient**. (NOTE: Only a few courier services have access to the Pentagon.) BMDO will acknowledge receipt if the proposal includes a self-addressed stamped envelope.

BMDO seeks the most innovative technology to find and disable a missile in flight - lighter, faster, smarter, more reliable components. Proposers need not know details of possible BMDO systems.

BMDO seeks to invest seed-capital, to supplement private capital, in a product with a future market potential (preferably private sector) and a measurable BMDO benefit. BMDO will not compete with private or government markets in that it will not further develop concepts already mature enough to compete for private capital or government development funds. BMDO prefers projects which move technology from the non-profit institution into the private sector market through a market-oriented small firm. BMDO expects to fund about 20 projects.

Phase I should be only an examination of the feasibility and competitive merit of the concept with an average cost about $60,000. Although proposed cost will not affect selection for negotiation, contracting may be delayed if BMDO reduces the cost ceiling. Phase I competition will give approximately equal weight to degree of innovation and market potential. Phase II competition will give more weight to future market potential. BMDO expects keen competition for both Phases.

Because BMDO seeks the best nation-wide experts in innovative technology, proposers may suggest both technical reviewers and contract technical monitors by enclosing a cover letter with the name, organization, address and phone number (if known), and a rationale for each suggestion. Each must be a government employee. BMDO promises only to consider the suggestion.

BMDO 96T001 TITLE: Sensors

DESCRIPTION: Sensors provide warning of attack, target identification, target discrimination from non-target objects, and determination of kill. New and innovative approaches are sought for sensors in the infrared, visible, and ultraviolet wavelengths for passive, active, and interactive sensors. Examples are: cryogenic cooling, superconducting focal plane elements, low power optical beam steering, passive focal plane imaging, interferometry for imaging, optics, diode pumped lasers, and optical materials.

BMDO 96T002 TITLE: Electronics and Photonics

DESCRIPTION: BMDO needs advances in processing capacity made possible by advances in electronics and opto-electronics. BMDO wants to advance integrated circuits, detectors, sensors, large scale integration, and radiation hardness. Advances are sought in band gap engineering, single crystal diamond, solid state lasers, optical detectors, electronics packaging, and any other related breakthrough technology.

BMDO 96T003 TITLE: Surprises and Opportunities

DESCRIPTION: BMDO recognizes that, at the leading edge of technology, surprises and opportunities may arise from creative minds and entrepreneurs. BMDO will consider proposals in other technologies that present an extraordinary opportunity for BMDO. But proposals will receive a preliminary screening that may reject them without full technical review as not offering enough of an extraordinary opportunity. This open call is for breakthrough technology with great market potential beyond the standards for the topics listed above.

9.0 SUBMISSION FORMS AND CERTIFICATIONS

Section 9.0 contains:

Appendix A: **Proposal Cover Sheet**
An original red-printed Appendix A must be included with each proposal submitted.

Appendix B: **Project Summary Form**
An original red-printed Appendix B must be included with each proposal submitted. Don't include proprietary or classified information in the project summary form.

Appendix C: **Cost Proposal Outline**
A cost proposal following the format in Appendix C must be included with each proposal submitted.

Appendix D: **Fast Track Application Form**
A new DoD pilot program that provides interim funding and speeds Phase II award process for projects that attract third party funding.

Reference A: **Model Agreement for the Allocation of Intellectual Property and Follow-on Rights**
This is only a model provided as a guideline for the small business in the development of an agreement that allocates intellectual property rights and rights to follow-on research, development, or commercialization between the small business and the research institution (see Section 3.4.o for more details). The small business is not required to use this model agreement, in whole or part, for its agreement with the research institution. A written agreement between the small business and research institution need not be submitted with the proposal, but must be available upon request.

Reference B: **Proposal Receipt Notification Form**

Reference C: **Directory of Small Business Specialists**

Reference D: **SF 298 Report Documentation Page**

Reference E: **DoD SBIR/STTR Mailing List Form**

Reference F: **List of Eligible FFRDCs**

APPENDIX A

U.S. DEPARTMENT OF DEFENSE

SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM

PROPOSAL COVER SHEET

Failure to use a RED Copy as the original for each proposal and to fill in all appropriate spaces may cause your proposal to be disqualified

TOPIC NUMBER:	PROPOSAL TITLE:	
PRINCIPAL INVESTIGATOR:		PI TELEPHONE:
PROPOSED COST:	PHASE I OR II:	PROPOSED DURATION IN MONTHS:

FIRM	RESEARCH INSTITUTION
NAME:	NAME:
STREET:	STREET:
CITY: STATE: ZIP:	CITY: STATE: ZIP:
CORPORATE OFFICIAL NAME:	INSTITUTE OFFICIAL NAME:
TITLE:	TITLE:
TELEPHONE:	TELEPHONE:
PERCENTAGE OF WORK: (minimum of 40%)	PERCENTAGE OF WORK: (minimum of 30%)

CERTIFICATION:	YES	NO
Is the FIRM a small business as described in section 2.3?	☐	☐
Is the INSTITUTION a research institution as defined in section 2.4?	☐	☐
Is the FIRM a socially and economically disadvantaged business as defined in section 2.5? (Collected for statistical purposes only)	☐	☐
Is the FIRM a woman-owned small business as described in section 2.6? (Collected for statistical purposes only)	☐	☐
Number of employees in the FIRM including all affiliates:	----------	
Has this proposal has been submitted to other government agencies or DoD components? If yes, list the names of the agency or component and topic number below:	☐	☐

For any purpose other than to evaluate the proposal, this data except Appendix A and B shall not be disclosed outside the Government and shall not be duplicated, used or disclosed in whole or in part, provided that if a contract is awarded to this proposer as a result of or in connection with the submission of this data, the Government shall have the right to duplicate, use or disclose the data to the extent provided in the funding agreement. This restriction does not limit the Government's right to use information contained in the data if it is obtained from another source without restriction.

SIGNATURE OF PRINCIPAL INVESTIGATOR DATE	SIGNATURE OF CORPORATE OFFICIAL DATE	SIGNATURE OF INSTITUTION OFFICIAL DATE

Nothing on this page is classified or proprietary information/data

INSTRUCTIONS FOR COMPLETING APPENDIX A

AND APPENDIX B

General:

DOD Components employ automated optical devices to record STTR proposal information. Therefore the proposal cover sheet (Appendix A) and the project summary (Appendix B) should be TYPED without proportional spacing using one of the following type styles:

Courier 12,10 or 12 pitch
Courier 71 10 pitch
Elite 71
Letter Gothic 10 or 12 pitch
OCR-B 10 or 12 pitch
Pica 72 10 pitch
Prestige Elite 10 or 12 pitch
Prestige Pica 10 Pitch

Whenever a numerical value is requested type the numerical character (i.e. in "Proposed Duration" type 6 NOT six).

When typing address information use the two alphabet characters used by the Post Office for the state, DO NOT SPELL OUT THE FULL STATE NAME (i.e. type NY not New York or N.Y.).

Complete and SUBMIT THE ORIGINAL RED FORMS bound in this solicitation (not photocopies) as page 1 and 2 of the original copy of each proposal. The completed forms can then be copied for use as pages 1 and 2 of the photocopies of the proposal. The original proposal (with red forms) plus (4) complete copies must be submitted (see Section 6).

Carefully align the forms in the typewriter using the underlines as a guide. The forms are printed to accommodate standard typewriter spacing.

Additional red forms may be obtained from your State SBIR/STTR Organization (Reference C) or:

Defense Technical Information Center
ATTN: DTIC-User Services
8725 John J Kingman Rd, Suite 0944
Ft. Belvoir, VA 22060-6218
(800) 363-7247 (800 DOD-SBIR)

U.S. DEPARTMENT OF DEFENSE

SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM

PROPOSAL COVER SHEET

Failure to use a RED Copy as the original for each proposal and to fill in all appropriate spaces may cause your proposal to be disqualified

TOPIC NUMBER:	PROPOSAL TITLE:	
PHASE I OR II PROPOSAL:	FIRM NAME:	PRINCIPAL INVESTIGATOR:

TECHNICAL ABSTRACT (Limit your abstract to 200 words with no classified or proprietary information/data)

ANTICIPATED BENEFITS/POTENTIAL COMMERCIAL APPLICATIONS OF THE RESEARCH OR DEVELOPMENT

KEYWORDS (List a maximum of 8 Keywords that describe the project)

Nothing on this page is classified or proprietary information/data

INSTRUCTIONS FOR COMPLETING APPENDIX A

AND APPENDIX B

General:

DOD Components employ automated optical devices to record STTR proposal information. Therefore the proposal cover sheet (Appendix A) and the project summary (Appendix B) should be TYPED without proportional spacing using one of the following type styles:

Courier 12,10 or 12 pitch
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Elite 71
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OCR-B 10 or 12 pitch
Pica 72 10 pitch
Prestige Elite 10 or 12 pitch
Prestige Pica 10 Pitch

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Carefully align the forms in the typewriter using the underlines as a guide. The forms are printed to accommodate standard typewriter spacing.

Additional red forms may be obtained from your State SBIR/STTR Organization (Reference C) or:

Defense Technical Information Center
ATTN: DTIC-User Services
8725 John J Kingman Rd, Suite 0944
Ft. Belvoir, VA 22060-6218
(800) 363-7247 (800 DOD-SBIR)

APPENDIX A

U.S. DEPARTMENT OF DEFENSE

SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM

PROPOSAL COVER SHEET

Failure to use a RED Copy as the original for each proposal and to fill in all appropriate spaces may cause your proposal to be disqualified

TOPIC NUMBER:	PROPOSAL TITLE:	
PRINCIPAL INVESTIGATOR:		PI TELEPHONE:
PROPOSED COST:	PHASE I OR II:	PROPOSED DURATION IN MONTHS:

FIRM	RESEARCH INSTITUTION
NAME:	NAME:
STREET:	STREET:
CITY: STATE: ZIP:	CITY: STATE: ZIP:
CORPORATE OFFICIAL NAME:	INSTITUTE OFFICIAL NAME:
TITLE:	TITLE:
TELEPHONE:	TELEPHONE:
PERCENTAGE OF WORK: (minimum of 40%)	PERCENTAGE OF WORK: (minimum of 30%)

CERTIFICATION:	YES	NO
Is the FIRM a small business as described in section 2.3?	☐	☐
Is the INSTITUTION a research institution as defined in section 2.4?	☐	☐
Is the FIRM a socially and economically disadvantaged business as defined in section 2.5? (Collected for statistical purposes only)	☐	☐
Is the FIRM a woman-owned small business as described in section 2.6? (Collected for statistical purposes only)	☐	☐
Number of employees in the FIRM including all affiliates:	----------	
Has this proposal has been submitted to other government agencies or DoD components? If yes, list the names of the agency or component and topic number below:	☐	☐

For any purpose other than to evaluate the proposal, this data except Appendix A and B shall not be disclosed outside the Government and shall not be duplicated, used or disclosed in whole or in part, provided that if a contract is awarded to this proposer as a result of or in connection with the submission of this data, the Government shall have the right to duplicate, use or disclose the data to the extent provided in the funding agreement. This restriction does not limit the Government's right to use information contained in the data if it is obtained from another source without restriction.

SIGNATURE OF PRINCIPAL INVESTIGATOR DATE	SIGNATURE OF CORPORATE OFFICIAL DATE	SIGNATURE OF INSTITUTION OFFICIAL DATE

Nothing on this page is classified or proprietary information/data

INSTRUCTIONS FOR COMPLETING APPENDIX A

AND APPENDIX B

General:

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Elite 71
Letter Gothic 10 or 12 pitch
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Whenever a numerical value is requested type the numerical character (i.e. in "Proposed Duration" type 6 NOT six).

When typing address information use the two alphabet characters used by the Post Office for the state, DO NOT SPELL OUT THE FULL STATE NAME (i.e. type NY not New York or N.Y.).

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Carefully align the forms in the typewriter using the underlines as a guide. The forms are printed to accommodate standard typewriter spacing.

Additional red forms may be obtained from your State SBIR/STTR Organization (Reference C) or:

Defense Technical Information Center
ATTN: DTIC-User Services
8725 John J Kingman Rd, Suite 0944
Ft. Belvoir, VA 22060-6218
(800) 363-7247 (800 DOD-SBIR)

U.S. DEPARTMENT OF DEFENSE

SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM

PROPOSAL COVER SHEET

Failure to use a RED Copy as the original for each proposal and to fill in all appropriate spaces may cause your proposal to be disqualified

TOPIC NUMBER:	PROPOSAL TITLE:	
PHASE I OR II PROPOSAL:	FIRM NAME:	PRINCIPAL INVESTIGATOR:

TECHNICAL ABSTRACT (Limit your abstract to 200 words with no classified or proprietary information/data)

ANTICIPATED BENEFITS/POTENTIAL COMMERCIAL APPLICATIONS OF THE RESEARCH OR DEVELOPMENT

KEYWORDS (List a maximum of 8 Keywords that describe the project)

Nothing on this page is classified or proprietary information/data

INSTRUCTIONS FOR COMPLETING APPENDIX A

AND APPENDIX B

General:

DOD Components employ automated optical devices to record STTR proposal information. Therefore the proposal cover sheet (Appendix A) and the project summary (Appendix B) should be TYPED without proportional spacing using one of the following type styles:

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U.S. DEPARTMENT OF DEFENSE

SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM

PROPOSAL COVER SHEET

Failure to use a RED Copy as the original for each proposal and to fill in all appropriate spaces may cause your proposal to be disqualified

TOPIC NUMBER:	PROPOSAL TITLE:	
PRINCIPAL INVESTIGATOR:		PI TELEPHONE:
PROPOSED COST:	PHASE I OR II:	PROPOSED DURATION IN MONTHS:

FIRM	RESEARCH INSTITUTION
NAME:	NAME:
STREET:	STREET:
CITY: STATE: ZIP:	CITY: STATE: ZIP:
CORPORATE OFFICIAL NAME:	INSTITUTE OFFICIAL NAME:
TITLE:	TITLE:
TELEPHONE:	TELEPHONE:
PERCENTAGE OF WORK: (minimum of 40%)	PERCENTAGE OF WORK: (minimum of 30%)

CERTIFICATION:	YES	NO
Is the FIRM a small business as described in section 2.3?	☐	☐
Is the INSTITUTION a research institution as defined in section 2.4?	☐	☐
Is the FIRM a socially and economically disadvantaged business as defined in section 2.5? (Collected for statistical purposes only)	☐	☐
Is the FIRM a woman-owned small business as described in section 2.6? (Collected for statistical purposes only)	☐	☐
Number of employees in the FIRM including all affiliates:	----------	
Has this proposal has been submitted to other government agencies or DoD components?	☐	☐

If yes, list the names of the agency or component and topic number below:

For any purpose other than to evaluate the proposal, this data except Appendix A and B shall not be disclosed outside the Government and shall not be duplicated, used or disclosed in whole or in part, provided that if a contract is awarded to this proposer as a result of or in connection with the submission of this data, the Government shall have the right to duplicate, use or disclose the data to the extent provided in the funding agreement. This restriction does not limit the Government's right to use information contained in the data if it is obtained from another source without restriction.

SIGNATURE OF PRINCIPAL INVESTIGATOR DATE	SIGNATURE OF CORPORATE OFFICIAL DATE	SIGNATURE OF INSTITUTION OFFICIAL DATE

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INSTRUCTIONS FOR COMPLETING APPENDIX A

AND APPENDIX B

General:

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U.S. DEPARTMENT OF DEFENSE

SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM

PROPOSAL COVER SHEET

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TOPIC NUMBER:	PROPOSAL TITLE:	
PHASE I OR II PROPOSAL:	FIRM NAME:	PRINCIPAL INVESTIGATOR:

TECHNICAL ABSTRACT (Limit your abstract to 200 words with no classified or proprietary information/data)

ANTICIPATED BENEFITS/POTENTIAL COMMERCIAL APPLICATIONS OF THE RESEARCH OR DEVELOPMENT

KEYWORDS (List a maximum of 8 Keywords that describe the project)

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INSTRUCTIONS FOR COMPLETING APPENDIX A

AND APPENDIX B

General:

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U.S. DEPARTMENT OF DEFENSE
SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM
PROPOSAL COVER SHEET

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TOPIC NUMBER:	PROPOSAL TITLE:	
PRINCIPAL INVESTIGATOR:		PI TELEPHONE:
PROPOSED COST:	PHASE I OR II:	PROPOSED DURATION IN MONTHS:

FIRM	RESEARCH INSTITUTION
NAME:	NAME:
STREET:	STREET:
CITY: STATE: ZIP:	CITY: STATE: ZIP:
CORPORATE OFFICIAL NAME:	INSTITUTE OFFICIAL NAME:
TITLE:	TITLE:
TELEPHONE:	TELEPHONE:
PERCENTAGE OF WORK: (minimum of 40%)	PERCENTAGE OF WORK: (minimum of 30%)

CERTIFICATION:	YES	NO
Is the FIRM a small business as described in section 2.3?	☐	☐
Is the INSTITUTION a research institution as defined in section 2.4?	☐	☐
Is the FIRM a socially and economically disadvantaged business as defined in section 2.5? (Collected for statistical purposes only)	☐	☐
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INSTRUCTIONS FOR COMPLETING APPENDIX A

AND APPENDIX B

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U.S. DEPARTMENT OF DEFENSE

SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM

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ANTICIPATED BENEFITS/POTENTIAL COMMERCIAL APPLICATIONS OF THE RESEARCH OR DEVELOPMENT

KEYWORDS (List a maximum of 8 Keywords that describe the project)

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INSTRUCTIONS FOR COMPLETING APPENDIX A

AND APPENDIX B

General:

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U.S. DEPARTMENT OF DEFENSE

SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM

COST PROPOSAL

Background:

The following items, as appropriate, should be included in proposals responsive to the DoD Solicitation Brochure.

Cost Breakdown Items (in this order, as appropriate):

1. Name of offeror
2. Home office address
3. Location where work will be performed
4. Title of proposed effort
5. Topic number and topic title from DoD Solicitation Brochure
6. Total dollar amount of the proposal
7. Direct material costs
   a. Purchased parts (dollars)
   b. Subcontracted items (dollars)
   c. Other
      (1) Raw material (dollars)
      (2) Your standard commercial items (dollars)
      (3) Interdivisional transfers (at other than cost dollars)
   d. Total direct material (dollars)
8. Material overhead (rate_____%) x total direct material = dollars
9. Direct labor (specify)
   a. Type of labor, estimated hours, rate per hour and dollar cost for each type
   b. Total estimated direct labor (dollars)
10. Labor overhead
    a. Identify overhead rate, the hour base and dollar cost
    b. Total estimated labor overhead (dollars)
11. Special testing (include field work at government installations)
    a. Provide dollar cost for each item of special testing
    b. Estimated total special testing (dollars)
12. Special equipment
    a. If direct charge, specify each item and cost of each
    b. Estimated total special equipment (dollars)
13. Travel (if direct charge)
    a. Transportation (detailed breakdown and dollars)
    b. Per diem or subsistence (details and dollars)
    c. Estimated total travel (dollars)
14. Consultants
    a. Identify each, with purpose, and dollar rates
    b. Total estimated consultants costs (dollars)
15. Other direct costs (specify)
    a. Total estimated direct cost and overhead (dollars)
16. General and administrative expense
    a. Percentage rate applied
    b. Total estimated cost of G&A expense (dollars)
17. Royalties (specify)
    a. Estimated cost (dollars)
18. Fee or profit (dollars
19. Total estimate cost and fee or profit (dollars)
20. The cost breakdown portion of a proposal must be signed by a responsible official, and the person signing must have typed name and title and date of signature must be indicated.
21. On the following items offeror must provide a yes or no answer to each question.
    a. Has any executive agency of the United State Government performed any review of your accounts or records in connection with any other government prime contract or subcontract within the past twelve months? If yes, provide the name and address of the reviewing office, name of the individual and telephone extension.
    b. Will you require the use of any government property in the performance of this proposal? If yes, identify.
    c. Do you require government contract financing to perform this proposed contract? If yes, then specify type as advanced payments or progress payments.
22. Type of contract proposed, either cost-plus-fixed-fee or firm-fixed price.

U.S. DEPARTMENT OF DEFENSE
SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM
FAST TRACK APPLICATION FORM

Failure to fill in all appropriate spaces may cause your proposal to be disqualified

FAST TRACK PROGRAM QUALIFICATIONS (see Section 4.4 of the solicitation for detailed explanation)
To qualify for the STTR Fast-Track, a company must submit the following items, at least 60 days prior to completion of its Phase I project, to the same address the company would send its Phase II proposal (see back):

(1) This application form, completed (please also send a copy to OSD SBIR/STTR -- see back);
(2) A commitment letter from an independent third-party investor indicating that the third-party investor will match both interim and Phase II STTR funding, in cash, at the matching rate noted below (under Business Certification);
(3) A concise statement of work for the Interim STTR effort (if an interim option was not negotiated on the Phase I contract) -- under 4 pages in length;
(4) A concise report on the status of the Phase I project (if required by the DoD component that is funding the project) -- under 4 pages in length;

In addition:

(1) The company must submit its Phase II proposal no later than 30 days prior to completion of its Phase I project (unless a different deadline for submission of fast-track Phase II proposals is specified in the Phase II proposal instructions of the sponsoring DoD component).
(2) If the company receives an interim and/or Phase II STTR award from DoD, its matching funds must arrive before corresponding installments of STTR funds are released (see Section 4.4 for explanation)

TOPIC #:	CONTRACT #:	PHASE I COMPLETION DATE:
PHASE I TITLE:		
FIRM:		
STREET:		
CITY:	STATE:	ZIP:
RESEARCH INSTITUTION:		

BUSINESS CERTIFICATION:

	YES	NO	MATCHING RATE
▸ Do you have 10 or fewer employees and have never received a Phase II SBIR or STTR award from the federal government (including DoD)? (If YES, the minimum Third Party matching rate is 25 cents for every STTR dollar)	☐	☐	25¢:$1 ☐
▸ Have you received 5 or more Phase II SBIR or STTR awards from the federal government (including DoD)? (If YES, the minimum Third Party matching rate is $1 for every STTR dollar)	☐	☐	$1:$1 ☐
If you answered NO to both questions, the minimum Third Party matching rate is 50 cents for every STTR dollar.			50¢:$1 ☐

DOD STTR AGENCY:	THIRD PARTY INVESTOR:
PROPOSED STTR INTERIM COST:	3RD PARTY INTERIM FUNDING:
PROPOSED STTR PHASE II COST:	3RD PARTY PHASE II FUNDING:
FIRM CORPORATE OFFICIAL	**THIRD PARTY INVESTOR CORPORATE OFFICIAL**
NAME:	NAME:
TITLE:	TITLE:
TELEPHONE:	TELEPHONE:
SIGNATURE: DATE:	SIGNATURE: DATE:

Nothing on this page is classified or proprietary information/data

INSTRUCTIONS FOR COMPLETING APPENDIX D

General:

The Fast Track Application Form (Appendix D) should be typed in either a 10 or 12 characters per inch font.

Carefully align the forms in the typewriter using the underlines as a guide.

When typing address information use the two alphabet characters used by the Post Office for the state (i.e. type NY not New York).

Submission:

Submit all items to the same address you would send your Phase II proposal. This will be listed in the Phase II proposal instructions sent to you at the start of your Phase I project. (If you do not yet have the Phase II proposal instructions, please contact your DoD contracting officer.)

Also, please send a copy of this application form, when completed, to OSD SBIR/STTR, 3061 Defense Pentagon, Room 2A338, Washington, DC 20301-3061. Do not submit other items to OSD SBIR/STTR.

Request for Copies:

Additional red forms may be obtained from your State SBIR Organization (Reference D) or:

Defense Technical Information Center
ATTN: DTIC-SBIR/STTR
8725 John J Kingman Road, Suite 0944
Ft. Belvoir, VA 22060-6218
(800) 363-7247 (800 DOD-SBIR)

U.S. DEPARTMENT OF DEFENSE

SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM

FAST TRACK APPLICATION FORM

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FAST TRACK PROGRAM QUALIFICATIONS (see Section 4.4 of the solicitation for detailed explanation)

To qualify for the STTR Fast-Track, a company must submit the following items, at least 60 days prior to completion of its Phase I project, to the same address the company would send its Phase II proposal (see back):

(1) This application form, completed (please also send a copy to OSD SBIR/STTR -- see back);

(2) A commitment letter from an independent third-party investor indicating that the third-party investor will match both interim and Phase II STTR funding, in cash, at the matching rate noted below (under Business Certification);

(3) A concise statement of work for the Interim STTR effort (if an interim option was not negotiated on the Phase I contract) -- under 4 pages in length;

(4) A concise report on the status of the Phase I project (if required by the DoD component that is funding the project) -- under 4 pages in length;

In addition:

(1) The company must submit its Phase II proposal no later than 30 days prior to completion of its Phase I project (unless a different deadline for submission of fast-track Phase II proposals is specified in the Phase II proposal instructions of the sponsoring DoD component).

(2) If the company receives an interim and/or Phase II STTR award from DoD, its matching funds must arrive before corresponding installments of STTR funds are released (see Section 4.4 for explanation)

TOPIC #:	CONTRACT #:	PHASE I COMPLETION DATE:
PHASE I TITLE:		
FIRM:		
STREET:		
CITY:	STATE:	ZIP:
RESEARCH INSTITUTION:		

BUSINESS CERTIFICATION:

	YES	NO	MATCHING RATE
▸ Do you have 10 or fewer employees and have never received a Phase II SBIR or STTR award from the federal government (including DoD)? (If YES, the minimum Third Party matching rate is 25 cents for every STTR dollar)	☐	☐	25¢:$1 ☐
▸ Have you received 5 or more Phase II SBIR or STTR awards from the federal government (including DoD)? (If YES, the minimum Third Party matching rate is $1 for every STTR dollar)	☐	☐	$1:$1 ☐
If you answered NO to both questions, the minimum Third Party matching rate is 50 cents for every STTR dollar.			50¢:$1 ☐

DOD STTR AGENCY:	THIRD PARTY INVESTOR:
PROPOSED STTR INTERIM COST:	3RD PARTY INTERIM FUNDING:
PROPOSED STTR PHASE II COST:	3RD PARTY PHASE II FUNDING:
FIRM CORPORATE OFFICIAL	THIRD PARTY INVESTOR CORPORATE OFFICIAL
NAME:	NAME:
TITLE:	TITLE:
TELEPHONE:	TELEPHONE:
SIGNATURE: DATE:	SIGNATURE: DATE:

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INSTRUCTIONS FOR COMPLETING APPENDIX D

General:

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Submission:

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Request for Copies:

Additional red forms may be obtained from your State SBIR Organization (Reference D) or:

Defense Technical Information Center
ATTN: DTIC-SBIR/STTR
8725 John J Kingman Road, Suite 0944
Ft. Belvoir, VA 22060-6218
(800) 363-7247 (800 DOD-SBIR)

U.S. DEPARTMENT OF DEFENSE
SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM
FAST TRACK APPLICATION FORM

Failure to fill in all appropriate spaces may cause your proposal to be disqualified

FAST TRACK PROGRAM QUALIFICATIONS (see Section 4.4 of the solicitation for detailed explanation)
To qualify for the STTR Fast-Track, a company must submit the following items, at least 60 days prior to completion of its Phase I project, to the same address the company would send its Phase II proposal (see back):

(1) This application form, completed (please also send a copy to OSD SBIR/STTR -- see back);
(2) A commitment letter from an independent third-party investor indicating that the third-party investor will match both interim and Phase II STTR funding, in cash, at the matching rate noted below (under Business Certification);
(3) A concise statement of work for the Interim STTR effort (if an interim option was not negotiated on the Phase I contract) -- under 4 pages in length;
(4) A concise report on the status of the Phase I project (if required by the DoD component that is funding the project) -- under 4 pages in length;

In addition:

(1) The company must submit its Phase II proposal no later than 30 days prior to completion of its Phase I project (unless a different deadline for submission of fast-track Phase II proposals is specified in the Phase II proposal instructions of the sponsoring DoD component).
(2) If the company receives an interim and/or Phase II STTR award from DoD, its matching funds must arrive before corresponding installments of STTR funds are released (see Section 4.4 for explanation)

TOPIC #:	CONTRACT #:	PHASE I COMPLETION DATE:
PHASE I TITLE:		
FIRM:		
STREET:		
CITY:	STATE:	ZIP:
RESEARCH INSTITUTION:		

BUSINESS CERTIFICATION:

	YES	NO	MATCHING RATE
▸ Do you have 10 or fewer employees and have never received a Phase II SBIR or STTR award from the federal government (including DoD)? (If YES, the minimum Third Party matching rate is 25 cents for every STTR dollar)	☐	☐	25¢:$1 ☐
▸ Have you received 5 or more Phase II SBIR or STTR awards from the federal government (including DoD)? (If YES, the minimum Third Party matching rate is $1 for every STTR dollar)	☐	☐	$1:$1 ☐
If you answered NO to both questions, the minimum Third Party matching rate is 50 cents for every STTR dollar.			50¢:$1 ☐

DOD STTR AGENCY:	THIRD PARTY INVESTOR:
PROPOSED STTR INTERIM COST:	3RD PARTY INTERIM FUNDING:
PROPOSED STTR PHASE II COST:	3RD PARTY PHASE II FUNDING:
FIRM CORPORATE OFFICIAL	THIRD PARTY INVESTOR CORPORATE OFFICIAL
NAME:	NAME:
TITLE:	TITLE:
TELEPHONE:	TELEPHONE:
SIGNATURE: DATE:	SIGNATURE: DATE:

INSTRUCTIONS FOR COMPLETING APPENDIX D

General:

The Fast Track Application Form (Appendix D) should be typed in either a 10 or 12 characters per inch font.

Carefully align the forms in the typewriter using the underlines as a guide.

When typing address information use the two alphabet characters used by the Post Office for the state (i.e. type NY not New York).

Submission:

Submit all items to the same address you would send your Phase II proposal. This will be listed in the Phase II proposal instructions sent to you at the start of your Phase I project. (If you do not yet have the Phase II proposal instructions, please contact your DoD contracting officer.)

Also, please send a copy of this application form, when completed, to OSD SBIR/STTR, 3061 Defense Pentagon, Room 2A338, Washington, DC 20301-3061. Do not submit other items to OSD SBIR/STTR.

Request for Copies:

Additional red forms may be obtained from your State SBIR Organization (Reference D) or:

Defense Technical Information Center
ATTN: DTIC-SBIR/STTR
8725 John J Kingman Road, Suite 0944
Ft. Belvoir, VA 22060-6218
(800) 363-7247 (800 DOD-SBIR)

U.S. DEPARTMENT OF DEFENSE
SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM
FAST TRACK APPLICATION FORM

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TOPIC #:	CONTRACT #:	PHASE I COMPLETION DATE:
PHASE I TITLE:		
FIRM:		
STREET:		
CITY:	STATE:	ZIP:
RESEARCH INSTITUTION:		

BUSINESS CERTIFICATION:

	YES	NO	MATCHING RATE
▸ Do you have 10 or fewer employees and have never received a Phase II SBIR or STTR award from the federal government (including DoD)? (If YES, the minimum Third Party matching rate is 25 cents for every STTR dollar)	☐	☐	25¢:$1 ☐
▸ Have you received 5 or more Phase II SBIR or STTR awards from the federal government (including DoD)? (If YES, the minimum Third Party matching rate is $1 for every STTR dollar)	☐	☐	$1:$1 ☐
If you answered NO to both questions, the minimum Third Party matching rate is 50 cents for every STTR dollar.			50¢:$1 ☐

DOD STTR AGENCY:	THIRD PARTY INVESTOR:
PROPOSED STTR INTERIM COST:	3RD PARTY INTERIM FUNDING:
PROPOSED STTR PHASE II COST:	3RD PARTY PHASE II FUNDING:
FIRM CORPORATE OFFICIAL	THIRD PARTY INVESTOR CORPORATE OFFICIAL
NAME:	NAME:
TITLE:	TITLE:
TELEPHONE:	TELEPHONE:
SIGNATURE: DATE:	SIGNATURE: DATE:

Nothing on this page is classified or proprietary information/data

INSTRUCTIONS FOR COMPLETING APPENDIX D

General:

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Submit all items to the same address you would send your Phase II proposal. This will be listed in the Phase II proposal instructions sent to you at the start of your Phase I project. (If you do not yet have the Phase II proposal instructions, please contact your DoD contracting officer.)

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Defense Technical Information Center
ATTN: DTIC-SBIR/STTR
8725 John J Kingman Road, Suite 0944
Ft. Belvoir, VA 22060-6218
(800) 363-7247 (800 DOD-SBIR)

SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM

ALLOCATION OF RIGHTS IN INTELLECTUAL PROPERTY AND RIGHTS TO CARRY OUT FOLLOW-ON RESEARCH, DEVELOPMENT, OR COMMERCIALIZATION

(This is only a model)

This Agreement between _____, a small business concern organized as a _____ under the laws of _____ and having a principal place of business at _____ _____, ("SBC") and _____ _____, a research institution having a principal place of business at _____ _____, ("RI") is entered into for the purpose of allocating between the parties certain rights relating to an STTR project to be carried out by SBC and RI (hereinafter referred to as the "PARTIES") under an STTR funding agreement that may be awarded by _____ ("AGENCY") to SBC to fund a proposal entitled "_____" submitted, or to be submitted, to AGENCY by SBC on or about _____, 199_.

1. Applicability of this Agreement.

(a) This Agreement shall be applicable only to matters relating to the STTR project referred to in the preamble above.

(b) If a funding agreement for an STTR project is awarded to SBC based upon the STTR proposal referred to in the preamble above, SBC will promptly provide a copy of such funding agreement to RI, and SBC will make a subaward to RI in accordance with the funding agreement, the proposal, and this Agreement. If the terms of such funding agreement appear to be inconsistent with the provisions of this Agreement, the PARTIES will attempt in good faith to resolve any such inconsistencies. However, if such resolution is not achieved within a reasonable period, SBC shall not be obligated to award nor RI to accept the subaward. If a subaward is made by SBC and accepted by RI, this Agreement shall not be applicable to contradict the terms of such subaward or of the funding agreement awarded by AGENCY to SBC except on the grounds of fraud, misrepresentation, or mistake, but shall be considered to resolve ambiguities in the terms of the subaward.

(c) The provisions of this Agreement shall apply to any and all consultants, subcontractors, independent contractors, or other individuals employed by SBC or RI for the purposes of this STTR project.

2. Background Intellectual Property.

(a) "Background Intellectual Property" means property and the legal right therein of either or both parties developed before or independent of this Agreement including inventions, patent applications, patents, copyrights, trademarks, mask works, trade secrets and any information embodying proprietary data such as technical data and computer software.

(b) This Agreement shall not be construed as implying that either party hereto shall have the right to use Background Intellectual Property of the other in connection with this STTR project except as otherwise provided hereunder.

(1) The following Background Intellectual Property of SBC may be used nonexclusively and, except as noted, without compensation by RI in connection with research or development activities for this STTR project (if "none" so state):
_____;

(2) The following Background Intellectual Property of RI may be used nonexclusively and, except as noted, without compensation by SBC in connection with research or development activities for this STTR project (if "none" so state):
_____;

(3) The following Background Intellectual Property of RI may be used by SBC nonexclusively in connection with commercialization of the results of this STTR project, to the extent that such use is reasonably necessary for practical, efficient and competitive commercialization of such results but not for commercialization independent of the commercialization of such results, subject to any rights of the Government therein and upon the condition that SBC

pay to RI, in addition to any other royalty including any royalty specified in the following list, a royalty of __% of net sales or leases made by or under the authority of SBC of any product or service that embodies, or the manufacture or normal use of which entails the use of, all or any part of such Background Intellectual Property (if "none" so state):

_____.

3. Project Intellectual Property.

(a) "Project Intellectual Property" means the legal rights relating to inventions (including Subject Inventions as defined in 37 CFR § 401), patent applications, patents, copyrights, trademarks, mask works, trade secrets and any other legally protectable information, including computer software, first made or generated during the performance of this STTR Agreement.

(b) Except as otherwise provided herein, ownership of Project Intellectual Property shall vest in the party whose personnel conceived the subject matter or first actually reduced the subject matter to practice, and such party may perfect legal protection therein in its own name and at its own expense. Jointly made or generated Project Intellectual Property shall be jointly owned by the PARTIES unless otherwise agreed in writing. The SBC shall have the first option to perfect the rights in jointly made or generated Project Intellectual Property unless otherwise agreed in writing.

(1) The ownership, including rights to any revenues and profits, resulting from any product, process, or other innovation or invention based on the cooperative shall be allocated between the SBC and the RI as follows:
SBC Percent: _____ RI Percent: _____

(2) Expenses and other liabilities associated with the development and marketing of any product, process, or other innovation or invention shall be allocated as follows:
SBC Percent: _____ RI Percent: _____

(c) The PARTIES agree to disclose to each other, in writing, each and every Subject Invention, which may be patentable or otherwise protectable under the United States patent laws in Title 35, United States Code. The PARTIES acknowledge that they will disclose Subject Inventions to each other and the awarding agency within __ months after their respective inventor(s) first disclose the invention in writing to the person(s) responsible for patent matters of the disclosing Party. All written disclosures of such inventions shall contain sufficient detail of the invention, identification of any statutory bars, and shall be marked confidential, in accordance with 35 U.S.C. § 205.

(d) Each party hereto may use Project Intellectual Property of the other nonexclusively and without compensation in connection with research or development activities for this STTR project, including inclusion in STTR project reports to the AGENCY and proposals to the AGENCY for continued funding of this STTR project through additional phases.

(e) In addition to the Government's rights under the Patent Rights clause of 37 CFR § 401.14, the PARTIES agree that the Government shall have an irrevocable, royalty free, nonexclusive license for any governmental purpose in any Project Intellectual Property.

(f) SBC will have an option to commercialize the Project Intellectual Property of RI, subject to any rights of the Government therein, as follows--

(1) Where Project Intellectual Property of RI is a potentially patentable invention, SBC will have an exclusive option for a license to such invention, for an initial option period of ____ months after such invention has been reported to SBC. SBC may, at its election and subject to the patent expense reimbursement provisions of this section, extend such option for an additional ___ months by giving written notice of such election to RI prior to the expiration of the initial option period. During the period of such option following notice by SBC of election to extend, RI will pursue and maintain any patent protection for the invention requested in writing by SBC and, except with the written consent of SBC or upon the failure of SBC to reimburse patenting expenses as required under this section, will not voluntarily discontinue the pursuit and maintenance of any United States patent protection for the invention initiated by RI or of any patent protection requested by SBC. For any invention for which SBC gives notice of its election to extend the option, SBC will, within ___ days after invoice, reimburse RI for the expenses incurred by RI prior to expiration or termination of the option period in pursuing and maintaining (i) any United States patent protection initiated by RI and (ii) any patent protection requested by SBC. SBC may terminate such option at will by giving written notice to RI,

in which case further accrual of reimbursable patenting expenses hereunder, other than prior commitments not practically revocable, will cease upon RI's receipt of such notice. At any time prior to the expiration or termination of an option, SBC may exercise such option by giving written notice to RI, whereupon the parties will promptly and in good faith enter into negotiations for a license under RI's patent rights in the invention for SBC to make, use and/or sell products and/or services that embody, or the development, manufacture and/or use of which involves employment of, the invention. The terms of such license will include: (i) payment of reasonable royalties to RI on sales of products or services which embody, or the development, manufacture or use of which involves employment of, the invention; (ii) reimbursement by SBC of expenses incurred by RI in seeking and maintaining patent protection for the invention in countries covered by the license (which reimbursement, as well as any such patent expenses incurred directly by SBC with RI's authorization, insofar as deriving from RI's interest in such invention, may be offset in full against up to ____ of accrued royalties in excess of any minimum royalties due RI); and, in the case of an exclusive license, (iii) reasonable commercialization milestones and/or minimum royalties.

(2) Where Project Intellectual Property of RI is other than a potentially patentable invention, SBC will have an exclusive option for a license, for an option period extending until _____ months following completion of RI's performance of that phase of this STTR project in which such Project Intellectual Property of RI was developed by RI. SBC may exercise such option by giving written notice to RI, whereupon the parties will promptly and in good faith enter into negotiations for a license under RI's interest in the subject matter for SBC to make, use and/or sell products or services which embody, or the development, manufacture and/or use of which involve employment of, such Project Intellectual Property of RI. The terms of such license will include: (i) payment of reasonable royalties to RI on sales of products or services that embody, or the development, manufacture or use of which involves employment of, the Project Intellectual Property of RI and, in the case of an exclusive license, (ii) reasonable commercialization milestones and/or minimum royalties.

(3) Where more than one royalty might otherwise be due in respect of any unit of product or service under a license pursuant to this Agreement, the parties shall in good faith negotiate to ameliorate any effect thereof that would threaten the commercial viability of the affected products or services by providing in such license(s) for a reasonable discount or cap on total royalties due in respect of any such unit.

4. Follow-on Research or Development.

All follow-on work, including any licenses, contracts, subcontracts, sublicenses or arrangements of any type, shall contain appropriate provisions to implement the Project Intellectual Property rights provisions of this agreement and insure that the PARTIES and the Government obtain and retain such rights granted herein in all future resulting research, development, or commercialization work.

5. Confidentiality/Publication.

(a) Background Intellectual Property and Project Intellectual Property of a party, as well as other proprietary or confidential information of a party, disclosed by that party to the other in connection with this STTR project shall be received and held in confidence by the receiving party and, except with the consent of the disclosing party or as permitted under this Agreement, neither used by the receiving party nor disclosed by the receiving party to others, provided that the receiving party has notice that such information is regarded by the disclosing party as proprietary or confidential. However, these confidentiality obligations shall not apply to use or disclosure by the receiving party after such information is or becomes known to the public without breach of this provision or is or becomes known to the receiving party from a source reasonably believed to be independent of the disclosing party or is developed by or for the receiving party independently of its disclosure by the disclosing party.

(b) Subject to the terms of paragraph (a) above, either party may publish its results from this STTR project. However, the publishing party will give a right of refusal to the other party with respect to a proposed publication, as well as a ___ day period in which to review proposed publications and submit comments, which will be given full consideration before publication. Furthermore, upon request of the reviewing party, publication will be deferred for up to ____ additional days for preparation and filing of a patent application which the reviewing party has the right to file or to have filed at its request by the publishing party.

6. Liability.

(a) Each party disclaims all warranties running to the other or through the other to third parties, whether express or implied, including without limitation warranties of merchantability, fitness for a particular purpose, and freedom from infringement, as to any information, result, design, prototype, product or process deriving directly or indirectly and in whole or part from such party in connection with this STTR project.

(b) SBC will indemnify and hold harmless RI with regard to any claims arising in connection with commercialization of the results of this STTR project by or under the authority of SBC. The PARTIES will indemnify and hold harmless the Government with regard to any claims arising in connection with commercialization of the results of this STTR project.

7. Termination.

(a) This agreement may be terminated by either Party upon __ days written notice to the other Party. This agreement may also be terminated by either Party in the event of the failure of the other Party to comply with the terms of this agreement.

(b) In the event of termination by either Party, each Party shall be responsible for its share of the costs incurred through the effective date of termination, as well as its share of the costs incurred after the effective date of termination, and which are related to the termination. The confidentiality, use, and/or non-disclosure obligations of this agreement shall survive any termination of this agreement.

AGREED TO AND ACCEPTED--

Small Business Concern

By:_____ Date:_____

Print name:_____

Title:_____

Research Institution

By:_____ Date:_____

Print name:_____

Title:_____

RECEIPT NOTIFICATION

TO: _____
(Fill in firm name)

_____
(street)

_____
(city, state ZIP)

SUBJECT: STTR Solicitation No. 96
Topic No. _____
(Fill in Topic No.)

This is to notify you that your proposal in response to the subject solicitation and topic number has been received by

_____
(Fill in name of organization to which you will send your proposal)

_____ _____
Signature by receiving organization Date

DIRECTORY OF SMALL BUSINESS SPECIALISTS

Associate Directors of Small Business assigned at Defense Contract Management Districts (DCMD) and Defense Contract Management Area Operations (DCMAO):

DCMD WEST
ATTN: Renee Deavens
222 N. Sepulveda Blvd., Suite 1107
El Segundo, CA 90245-4394
(800) 233-6521 (Toll Free CA Only)
(800) 624-7372 (Toll Free-AK,HI,ID,MT,NV,OR,WA)
(310) 335-3260
(310) 335-4443 (FAX)

DCMAO San Francisco
ATTN: Joan Fosbery
1265 Borregas Ave.
Sunnyvale, CA 94089
(408) 541-7042

DCMAO San Diego
ATTN: Marvie Bowlin
7675 Dagget Street, Suite 100
San Diego, CA 92111-2241
(619) 637-4922

DCMAO Seattle
ATTN: Alice Toms
3009 112th Ave., NE, Suite 200
Bellvue, WA 98004-8019
(206) 889-7317/7318

DCMAO Santa Ana
ATTN: Laura Robello
34 Civic Center Plaza, PO Box C-12700
Santa Ana, CA 92172-2700
(714) 836-2913 (ext. 659 or 661)

DCMAO Van Nuys
ATTN: Dianne Thompson
6230 Van Nuys Boulevard
Van Nuys, CA 91401-2713
(818) 904-6158 (ext. 201)

DCMAO St. Louis
ATTN: William Wilkins
1222 Spruce Street
St. Louis, MO 63103-2811
(314) 331-5392
(800) 325-3419

DCMAO Phoenix
ATTN: Clarence Fouse
The Monroe School Building
215 N. 7th Street
Phoenix, AZ 85034-1012
(602) 379-6170 (ext 231 or 229)

DCMAO Chicago
ATTN: Norma Thorpe
O'Hare International Airport
10601 W. Higgins Road, PO Box 66911
Chicago, IL 60666-0911
(312) 825-6021

DCMAO Denver
ATTN: Robert Sever
Orchard Place 2, Suite 200
5975 Greenwood Plaza Blvd.
Englewood, CO 80110-4715
(303) 843-4381
(800) 722-8975

DCMAO Twin Cities
ATTN: Otto Murry
3001 Metro Drive, Suite 200
Bloominton, MN 55425-1573
(612) 335-2003

DCMAO Wichita
ATTN: George Luckman
U.S. Courthouse Suite D-34
401 N. Market Street
Wichita, KS 67202-2095
(316) 269-7137

DCMD NORTHEAST
ATTN: John McDonough
495 Summer Street, 8th Floor
Boston, MA 02210-2184
(800) 321-1861
(617) 753-4317/4318
(617) 753-3174 (FAX)

DCMAO Boston
ATTN: Philip Varney
495 Summer Street
Boston, MA 02210-2184
(617) 451-4108/4109/4110

DCMAO Cleveland
ATTN: Herman Peaks
1240 East 9th Street
Cleveland, OH 44199-2064
(216) 522-5446

DCMAO Dayton
ATTN: Betty Adams
Gentile Station
1001 Hamilton Street
Dayton, OH 45444-5300
(513) 296-5150

DCMAO Detroit
ATTN: David Boyd
905 McNamara Federal Bldg, 477 Michigan Ave.
Detroit, MI 48226-2506
(313) 226-5180

DCMAO Garden City
ATTN: Eileen Kelly
605 Stewart Avenue
Garden City, NY 11530-4761
(516) 228-5722

DCMAO Grand Rapids
ATTN: Kay Hamilton
678 Front Street, NW
Grand Rapids, MI 49504-5352
(616) 456-2620

DCMAO Hartford
ATTN: Frank Prater
130 Darlin Street
E. Hartford, CT 06108-3234
(203) 291-7705/7715

DCMAO Indianapolis
ATTN: Robert Staton
Building 1
Fort Benjamin Harrison, IN 46249-5701
(317) 542-2015

DCMAO New York
ATTN: John Castellane
207 New York Avenue
Staten Island, NY 10305-5013
(718) 390-1016

DCMAO Philadelphia
ATTN: Julia Graciano
2800 S. 20th Street, PO Box 7699
Philadelphia, PA 19101-7478
(215) 737-5818

DCMAO Pittsburgh
ATTN: Rich Spanard
1000 Liberty Avenue
Pittsburgh, PA 15222-4190
(412) 644-5926

DCMAO Reading
ATTN: Thomas Knudsen
1125 Berkshire Blvd., Suite 160
Reading, PA 19610-1249
(215) 320-5012

DCMAO Springfield
ATTN: Sylvia Liggins
955 South Springfield Ave.
Springfield, NJ 07081-3170
(201) 564-8343

DCMAO Stratford
ATTN: Otis Wade
550 Main Street
Stratford, CT 06497-7574
(203) 385-4416

DCMAO Syracuse
ATTN: Ralph Vinciguerra
615 Erie Boulevard, West
Syracuse, NY 13204-2408
(315) 448-7897

DCMD SOUTH
ATTN: Howard Head, Jr.
805 Walker Street
Marietta, GA 30060-2789
(800) 551-7801 (Toll Free-GA)
(800) 331-6415 (Nationwide)
(404) 590-6196
(404) 590-2612 (FAX)

DCMAO Atlanta
ATTN: Sandra Scanlon
805 Walker Street
Marietta, GA 30060-2789
(404) 590-6197
(404) 590-2110 (FAX)

DCMAO Baltimore
ATTN: Gregory W. Prouty
200 Towsontown Blvd.
Towson, MD 21204-5299
(410) 339-4809
(410) 339-4990 (FAX)

DCMAO Birmingham
ATTN: Lola Alexander
2121 Eight Avenue, N., Suite 104
Birmingham, AL 35203-2376
(205) 226-4304
(205) 251-5325 (FAX)

DCMAO Dallas
ATTN: Jerome Anderson
1200 Main Street, Room 640
PO Box 50500
Dallas, TX 75202-4399
(214) 670-9205
(214) 573-2182 (FAX)

DCMAO Orlando
ATTN: Victor Irizarry
3555 Maguire Boulevard
Orlando, FL 32803-3726
(407) 228-5113/5260
(407) 228-5312 (FAX)

DCMAO San Antonio
ATTN: Thomas Bauml
615 E. Houston Street, PO Box 1040
San Antonio, TX 78294-1040
(210) 229-4650
(210) 229-6092 (WPWPCCOMSPECPROMPT@
@^W^A^N^[U

DCDM INTERNATIONAL
DCMAO Puerto Rico
ATTN: Orlando Coriano
209 Chapel Drive
Navy Security Group Activity
Sabana Seca, PR 00952
(809) 795-3202
(809) 784-2011 (FAX)

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (*Leave Blank*)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED

4. TITLE AND SUBTITLE	5. FUNDING NUMBERS
6. AUTHOR(S)	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSORING/MONITORING AGENCY REPORT NUMBER
11. SUPPLEMENTARY NOTES	
12a. DISTRIBUTION/AVAILABILITY STATEMENT	12b. DISTRIBUTION CODE
13. ABSTRACT (*Maximum 200 words*)	
14. SUBJECT TERMS	15. NUMBER OF PAGES
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT

GENERAL INSTRUCTIONS FOR COMPLETING SF 298

The Report Documentation Page (RDP) is used in announcing and cataloging reports. It is important that this information be consistent with the rest of the report, particularly the cover and title page. Instructions for filling in each block of the form follow. It is important to stay within the lines to meet optical scanning requirements.

Block 1. Agency Use Only *(Leave blank).*

Block 2. Report Date. Full publication date including day, month, and year, if available (e.g. 1Jan88). Must cite at least the year.

Block 3. Type of Report and Dates Covered. State whether report is interim, final, etc. If applicable, enter inclusive report dates (e.g. 10Jan87 - 30Jun88).

Block 4. Title and Subtitle. A title is taken from the part of the report that provides the most meaningful and complete information. When a report is prepared in more than one volume, repeat the primary title, add volume number, and include subtitle for the specific volume. On classified documents enter the title classification in parentheses.

Block 5. Funding Numbers. To include contract and grant numbers; may include program element number(s), project number(s), task number(s), and work unit number(s). Use the following labels:

C	- Contract	**PR**	- Project
G	- Grant	**TA**	- Task
PE	- Program Element	**WU**	- Work Unit Accession No.

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